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# Telephony.

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**FORGET THE BLUNDERS OF YESTERDAY.**

**Finish every day and be donė with it! You have done what you could; some blunders and absurdities, no doubt, crept in. Forget them as soon as you can.**—Emerson.

### Hopeful Views for 1914.

Leading manufacturers, merchants and financiers take a very hopeful view of business prospects for the coming year. They think the period of inactivity has about passed, and, with currency reform and tariff revision in operation, the country should enter upon an era of good times.

There may not be a boom, they say, but, what is better, a steady, healthy improvement that will be of longer duration. President Wilson has done much to assure "big business" that the government has no desire to injure an industry that is within the law, but at the same time, it is definitely understood that there must be square dealing in corporation matters.

Men like J. Pierpont Morgan, J. H. Schiff and Henry Clews, representing New York banking interests, unite in saying that conditions are mending, and that a firmer confidence is noted in money circles. W. L. Saunders, president of the International Harvester Corporation; T. P. Shonts, the railroad man; Lewis Nixon and others prominent in industrial, merchandising and manufacturing lines, believe that the sun is breaking through the financial clouds, a forerunner that brighter days are coming. Shrewd observers like these say with justice that the chief reason for the recent business depression does not exist in the United States, but abroad, where wars and civil disturbances have led to bad monetary conditions. This country, as we all know, is inherently rich and commercially the master of the world. The slowing up of business is traceable to hard times in foreign countries, and the readjustment to needed changes in our own business system.

Concrete cases of an awakening in the business world are not lacking as the new year approaches. In South Bend, Ind., factories, 5,000 men will go back to work early this month. At Peoria, Ill., 4,000 men will be re-instated soon, and many factories will go back to full time. In Kenosha, Wis., plants are nearly back to normal, and within a week their forces will all be employed. At Racine, Wis., it is said, the big factories will be running full force within a fortnight. At Cleveland, Ohio, plants which have been idle for some time, are planning to resume operations this month, while at Akron the prospect is that an additional force will be needed in some of the factories. Similar reports are coming from other cities to show that there is a more hopeful feeling in the air.

Bankers agree that the stringency in the money market is practically over, and that legitimate enterprises should have no difficulty in obtaining capital for reasonable extensions of business. The fact that the leading banks are accepting the currency bill with apparent cheerfulness, and are going ahead on the assumption that good times are at the door, is also a significant incident of the recent developments.

The most blighting influence in the business world—and, in fact, in any sphere of human activity—has always been fear. When men fear, any real progress is well nigh impossible. Their energies are paralyzed, and the natural force which should be expended in improvement and development for the general good, lies idle and stagnant, while the faculties concentrate on that haunting dread which may be intangible but is destructive and wasteful. "Half our troubles never happen."

Now the business world is throwing off the weight of that fear of what the government might do. Business men are believing that President Wilson does not desire to tear down, but to build up—to build up on a foundation that will prove permanent and mean enduring success. The idea that genuine prosperity must include everybody is sinking into the minds of the big business men, and that idea seems to be the keynote of the Wilson plan. If this rule of conduct extends through 1914, the country will have reason to bless the coming year, and each one can do something to realize this desired plan.

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# PROGRAM

## First Annual Convention

# Independent Telephone Association of America

## Hotel La Salle, Chicago

## January 6, 7, 8 1914

Indications are that the approaching convention, January 6, 7 and 8, in Chicago, will be the largest gathering of telephone men ever held in the history of the industry. Nearly all the rooms on one whole floor of the Hotel La Salle have been engaged by telephone manufacturers and supply dealers. Letters received from many sections of the United States, bring word that many are coming to Chicago next week.

The program for the convention is as follows:

### TUESDAY MORNING, JANUARY 6.

Address of Welcome—Hon. Carter H. Harrison, Mayor of Chicago.
Response—D. M. Neill, Red Wing, Minn.
President's Address—Hon. E. B. Fisher, Grand Rapids, Mich.
Secretary's Report—W. S. Vivian, Chicago.
Report of Credentials Committee.
Appointment of Committees.

### TUESDAY AFTERNOON.

Stereopticon.
Experience Meeting—Lead by John H. Wright, Jamestown, N. Y.
"Troublesome Telephones"—Illustrated.
"Liability Insurance and the Workmen's Compensation Act"—W. A. Alexander, Chicago.
"Action of Wisconsin Railroad Commission on Standardization of Operating Rules and Practices"—J. C. Crowley, Jr., Superior, Wis.
"Industrial"—Illustrated.
"Died, But Not Dead"—Illustrated.

### WEDNESDAY MORNING, JANUARY 7.

"Hello Trouble!"—Illustrated.
"Important Facts in the Development of Independent Telephony"—John H. Wright, Jamestown, N. Y.
"An Accounting System Which is Flexible, Practical and Meets Requirements of State and National Commissions"—J. W. Coffey, Indianapolis, Ind.
"Telephone and Other Views of the Northwest"—Illustrated—J. B. Middleton, Portland, Ore.
"Publicity"—Jas. C. McCabe, Bay City, Mich.
"Harnessed Falls of the Northwest"—Illustrated.
"Industrial."

### WEDNESDAY AFTERNOON.

"Independent Telephony—What Shall It Be?"—C. B. Randall, St. Paul, Minn.
"The Little, Big Things of Transmission"—H. T. Currier, Chicago.
"Industrial"—Illustrated.
"The Little, Big Things of Traffic"—W. S. Vivian, Chicago.

### WEDNESDAY EVENING.

The Banquet—An evening of nonsense, music and song.

### THURSDAY MORNING, JANUARY 8.

"Competition as an Assistance to Municipal Regulation"—Chas. E. Merriam, Chicago.
"Industrial"—Illustrated.
"Business Building"—H. N. Tolles, Chicago.

### THURSDAY AFTERNOON.

Report of Committee on Resolutions.
Report of Special Committees.
Election.
New and Unfinished Business.

The election will include the selection of a president, first vice-president, second vice-president, six directors for two years and six directors for one year.

Everything is being done that can be done to make the convention one that not only will be thoroughly enjoyed every minute, but one which will be of profit and assistance to every one in attendance. In fact, the values will be such that no one can afford to let the small traveling expense stand in the way of their coming. IT MEANS DOLLARS IN YOUR POCKET.

(Signed) **W. S. VIVIAN.**

# The Year Nineteen Thirteen in the Telephone Industry

**Annual Survey of Events and Progress in Telephony in the United States and Europe—Engineering and Operating Improvements—Public Service Commissions and Their Activities—Relations of the Government to the Telephone Industry**

By Stanley R. Edwards

In making a survey of the telephone industry and its progress during the past year, it is seen that the advance is quite marked along the lines of the relation of telephone companies to the public and methods of furnishing better service, rather than an advance in engineering. One of the factors which tended to bring this about was the greater number of states in which the telephone companies are under commission supervision, both as to rates and service.

The most notable event of the year was the announcement of the arrangement made between the United States Department of Justice and the American Telephone & Telegraph Co. as to the principles to be observed by the latter in the future conduct of its business. The full details of the agreement by which the Bell corporation relinquishes its former monopoly policies were published in TELEPHONY in the issue of December 27. Thus the closing of the year marked what it is expected will prove, a new era in the telephone development of the country.

That the telephone is rapidly taking its place in the economic life of the people is demonstrated by its uses for purposes which, up to the past year, were decidedly infrequent, but for which it is now recognized as an essential factor.

Apparatus has been developed so that the telephone is now an important part in the equipment for mine rescue work, a special transmitter which is applied to the throat instead of the mouth having been perfected, thus permitting the use of mouth breathing apparatus by the rescuer.

### PRIVATE AND INTERCOMMUNICATING SYSTEMS.

Private telephone lines have been installed for business and other purposes. Some of these are of considerable length, but the expense is justified by the recognized value of the service. Among the private lines which may be mentioned, is one installed along the bank of the Erie Canal, between Lockport and Clyde, N. Y., a distance of 111 miles. Officials are enabled to keep in touch with and receive reports from employes along the canal at any time of the day or night; the locking of boats is greatly facilitated and notices of their approach can be telephoned from lock to lock and the lock tender can thus prepare in advance to handle the boats upon their arrival. Manufacturing and business concerns also have private lines between the cities where their factories and offices are located and the number of these has been increased during the year just past.

As an aid to the fighting of forest fires, the telephone is recognized as one of the most efficient aids which forest fire fighters possess. During the past year many lines, both private and government owned, have been constructed, or existing lines extended, so as to aid in decreasing the loss from forest fires. Nearly 4,000 miles of telephone lines were built by the United States forest service.

Among the indications of the operation of intercommunicating systems over a broader field, may be mentioned the introduction of the equipment in the private cars of one of the large railway systems, making it possible for a person to communicate from any part of the car, with persons in another part. Provision is also arranged for connection, when at stations, with outside lines for local or long distance calls.

In the limousine type of automobile, the telephone has replaced the speaking tube which was formerly provided to afford communication between the chauffeur and the passenger. The equipment includes a compact type of portable transmitter for use by the passenger and a loud-speaking receiver located in close proximity to the ear of the driver. Provision is made for signaling by the passenger to attract the chauffeur's attention. This equipment has come into quite general use during the year.

The large steamships placed in commission during the year are fully equipped with private telephone systems, and facilities are also provided for making connections with the city system when the vessels arrive at their piers. The use of the telephone is not confined to the large vessels alone, as systems have recently been installed on some of the smaller boats, replacing the speaking tube so long in use. Railroads have recognized the value of intercommunicating and private systems and during the year several such systems have been installed in railroad yards and terminals.

The business man also realizes the value of the telephone as a business-getter. In the newspapers of the larger cities may be seen advertisements of various kinds, urging the public to make use of the telephone in ordering or obtaining information relative to the advertiser's goods. Many firms now have special departments for handling their telephone trade which is recognized as an important part of the total business. In business the telephone has been used for many new purposes during the year.

### THE LOUD-SPEAKING RECEIVER.

The loud-speaking receiver has been developed so that it can be used commercially for many purposes. Announcements regarding trains are now made in many railroad stations by means of this type of receiver. Installations have been made in baseball parks, hotels, factories, public buildings, hospitals, wholesale houses and many other places where such apparatus can be used for paging, making announcements, furnishing musical programs, etc. It is used in garages for directing chauffeurs to take out certain cars and in giving other instructions. Many elevators in tall buildings are equipped with loud-speaking receivers so that the elevator starter can communicate with the operator at any time during the progress of the elevator in the up and down trips.

During the recent land show, which was held in the Coliseum

in Chicago, a type of loud-speaking receiver was used to good advantage in interpreting the language and pantomime of the play "Hiawatha," which was given by Indians. The speaker, telling the story of the play, so timed his words that they corresponded exactly with the movements of the actors. By the use of the loud-speaking receiver, the story could be distinctly heard in all parts of the large hall.

### New Buildings and Equipment Installed.

The past year has seen considerable activities in the building of new exchanges. This is caused by the demand for telephone service and lack of capacity in the old exchanges. TELEPHONY has published many items relative to the construction of new quarters for operating companies and the intentions of companies to install new equipment. Something over 100 companies announced, during the year, their intentions of building new exchanges or installing new equipment. The amount spent in this work involves thousands of dollars and even millions, and is indicative of the stability of the industry.

### Insurance and Pension Plan of Bell Company.

The year 1913 witnessed the introduction of the pension and insurance plan by the Bell companies. From the employes' point of view, its operation has been quite satisfactory. There are many cases recorded of sudden deaths which, but for the insurance received, would have caused the surviving members of the families great hardships. The amount received from the insurance provided by the companies has, in such cases, been of immeasurable benefit. The accident insurance provision has likewise proven its value. Many of the employes have retired from active service and have been placed on the pension list, receiving a comfortable allowance.

Through the institution of the insurance plan, the employes' benefit associations, which were formed by the employes of many Bell telephone companies, have been or will be abandoned as the insurance and pension fund provided by the Bell companies is entirely without any cost to the employe. The amounts received as benefits by the employes from this system are greater than those derived from their benefit associations. The monthly dues paid into the benefit associations varied from 25 cents to $1.50 per month, depending upon the salaries of those belonging to the organization, with a maximum death benefit of $600, while, under the present system, the maximum amount received by heirs is $2,000. When time is lost, due to injury or sickness, the full salary is paid, while under the employes' benefit association plan, the maximum amount was $2 a day for those who had paid the highest rate and lower amounts according to the rate paid.

### Engineering and Operating Development.

Progress has been made in engineering, but it has related more to the working out and perfection of details than to new departures. Development has been along lines looking to a more equal distribution of the traffic load among manual exchange operators by means of mechanical switching devices. Announcement has been made of the installation, by several companies, of mechanism for equalizing the load among the various operators, thus tending to greater efficiency and a reduction in the number of operators. This tendency is a step toward the use of semi-automatic and automatic equipment and it is brought about by the necessity for relieving the manually operated boards to which additions cannot well be made.

Multiple answering jacks, placed with the regular answering jacks, are being used by the Bell companies to obtain more equal distribution of the operator's load.

Another plan for increasing the operator's efficiency is the use of automatic ringing and listening in common battery single office exchanges. The answering and ringing is done without the operation of keys, thus reducing the number of movements in making connections and enabling the operator to handle more calls in a specified time.

Several companies, during the year, announced their intention of installing the new type of automatic and other types of semi-automatic equipment, experiments on which have been made for a number of years, and from which much is expected.

In the Chicago residence districts a new type of coin collector has been introduced and is rapidly replacing the "nickel first" machine which caused so much agitation about a year ago. With the use of the new coin collecting device, the operator answers when the receiver is removed from the hook and receives the number from the calling subscriber. She starts putting up the connection while the calling party deposits the nickel. If the coin is not deposited, the call is not completed, the circuit being open until automatically closed by the depositing of the coin. On calls for the police or fire department, the connection is promptly completed by the operator without a nickel being deposited.

In the placing of wires underground, a new departure was made by the Painesville Telephone Co., Painesville, Ohio, in installing cable underground without the use of conduit. The cable was laid in the bottom of a trench dug in the tree lawn or parkway. It was covered with tar paper and three inches of concrete, after which the trench was filled. Whether such a departure from customary practice will be successful can only be proven after sufficient time elapses to thoroughly test the method.

### Toll Line Progress.

Announcement was made the latter part of the year that the long distance line between Denver and the Pacific Coast will be in operation in 1915, in time for the opening of the Panama-Pacific Exposition in San Francisco. It is understood that active construction work is now under way between Denver and the coast. The overland line will be constructed of No. 8 copper wire and two circuits will be built for handling the business between San Francisco and New York. Conversation, it is reported, was held between New York City and San Francisco the latter part of the year and the test is said to have demonstrated that commercial telephony is entirely feasible. Work on the commercial circuits, as previously stated is already under way.

Of special interest to the Independent telephone operating companies was the publishing of standard toll operating rules by the Telephone Service Association. These rules were favorably received by many companies and have been adopted in a great number of Independent exchanges.

A new form of telephone publicity was developed during the

year—the use of moving pictures. Moving picture films were made by one of the large moving picture concerns, illustrating various phases of construction and operating work. Scenes were shown of men engaged in the construction of the outside plant and of operators and others engaged at their work in the exchanges. These films were shown at many moving picture theaters in the country and undoubtedly have been productive of much good to telephone companies in educating the public regarding the telephone industry.

### Telephone Train Dispatching.

Some of the advantages of telephone train dispatching that have been great factors in bringing about its extensive use, which has largely increased during the past year, are: That the time required for communication between way stations and dispatchers is greatly reduced; the way station operator is practically in instantaneous communication with the dispatcher's office; the dispatcher's office can call any way station on any division within a very short time, usually in from 4½ to 5 seconds; and signaling and talking can be done at the same time, and all stations can be called in the same length of time that was previously required for calling but one station. The transmission circuits are of the highest efficiency, being specially designed for train dispatching purposes.

Progress has been made in this field in the introduction of improved apparatus, looking toward efficiency in the use of circuits and the placing of a greater number of stations on the same line. The installation of equipment has been simplified by improvements which have been made in the design of apparatus. Another advance is the provision for sounding a secondary signal outside of the room in which the operator is located, in case the operator is not in his office when the first signal is sounded.

### Public Service Commissions.

Many cases involving telephone companies have been considered by the various state commissions and decisions rendered. These cases have related to a variety of subjects including accounting, valuations, rates, physical connection, service, capitalization, etc.

Public service commissions having jurisdiction over all classes of public utilities, including telephone corporations, have been established in a number of states, notably in Illinois, Indiana, Pennsylvania, and Missouri. State commissions have been given jurisdiction over electric utilities also in Idaho, Montana, West Virginia, Tennessee, North Carolina, and the District of Columbia. Laws establishing commissions with jurisdiction over telephone and other utilities were passed in Maine and Colorado but must await referendums of the voters of these states at the general elections which are to be held this year.

The duty which has devolved upon the state commissions to determine the reasonableness of rates, has necessitated that increasing attention be given to the valuation of telephone properties and to the proper methods of arriving at such valuations for rate making purposes. The decision in June of the Supreme Court of the United States in the Minnesota rate case affecting the railroads, in which the "fair value of the property" used for the convenience of the public, was declared the basis of calculations in rate making, was an annunciation of the basis recognized as proper by the various state commissions in dealing with telephone rate problems. There has been considerable discussion in the decisions of the commissions as to the percentage of earnings which it is proper to set aside to establish depreciation funds and as to various other allowances upon which a telephone company is fairly entitled to a return. Several of the commissions have gone quite deeply into these questions.

One of the notable appraisals made by state commission authority during the year, has been the appraisal of the consolidated system of the Bell and the automatic exchanges of the Lincoln Telephone & Telegraph Co., at Lincoln, Neb., which was made by the engineers of the Nebraska State Railway Commission. A ruling of the California commission in the San Jose rate case, is an instance of the close scrutiny to the various elements of the question of rate making values.

### Valuations for Rate Making Purposes.

Gradual recognition of the necessity of arriving at valuations of telephone property as preliminary to any serious attempt at rate revision, has brought the subject of valuation up in various forms. In Indianapolis, Ind., the Central Union (Bell) Telephone Co. undertook and recently completed an extensive valuation of its own property with a view of placing the figures before the Indiana Public Service Commission in asking for a rate advance. The Bell Telephone Co. of Pennsylvania, has recently insisted that the Pennsylvania Public Service Commission make a thorough valuation and analysis of the telephone property of the state, before promulgating a reduced schedule of rates. In Maryland, an agreement has been reached between the Chesapeake & Potomac Telephone Co. and the Maryland Public Service Commission whereby the telephone company will supply the commission with an appraisal of its property throughout the state as a basis for a decision as to rates.

In Missouri, the Southwestern (Bell) Telegraph & Telephone Co. has asked for an increase in rates, using as a basis for its demands the very complete valuation made in St. Louis by the St. Louis Public Service Commission and turned over to the Missouri Public Service Commission, which came into existence while the valuation was being made by the St. Louis body. In Vermont, several weeks have recently been devoted to an effort to arrive at the value of the property of the New England Telephone & Telegraph Co. by cross-examination of its officials and accountants.

In New York City, the New York Telephone Co., in response to a proposal by the Merchants' Association of that city, announced its purpose to co-operate with the Interstate Commerce Commission in a valuation of its property to be made by that commission. The Public Service Commission of New York has recognized the necessity of a fundamental valuation of the property of the company in New York City, but is only deterred by lack of funds. The proposal has been made to appeal to the legislature for funds with which to make such a valuation, in case action by the Interstate Commerce Commission is not to be immediate. These and other instances elsewhere throughout the country, indicate that the question of valuation has become of paramount importance.

### The Chicago Rate Ordinance.

Agitation as to changes in rates has been general throughout the country during the year and many changes have been made by order or approval of state commissions and by ordinance agreements between telephone companies and city councils. The rate ordinance which was adopted in the city of Chicago last May, is worthy of special mention because it was the culmination of three years spent in an investigation, at a cost to the city of $70,000. During the course of the investigation some four reports were made by telephone experts. The resultant rate reductions, however, were declared to insure savings to subscribers of many times this sum annually.

### Commission Rulings on Physical Connection.

A question which has been watched with interest during the year is that relating to compulsory physical connection between competing telephone companies under orders issued by the state commissions. In March the California commission issued an important ruling requiring the Pacific (Bell) Telephone & Telegraph Co. to interchange service with the Tehama County and Glenn County Independent companies and in May the Wisconsin commission, in a notable decision, ordered physical connection between the Wisconsin (Bell) Telephone Co. and the LaCross Telephone Co. Other state commissions which have issued physical connection orders in minor cases are those of Nebraska, Oklahoma and Indiana.

In late December, the supreme court of California handed down a decision stating that the physical connection ruling of the state commission was a violation of the constitution of the United States, inasmuch as it was confiscatory.

The South Dakota commission has ruled that it has no authority to order physical connection under the law existing in that state.

Another ruling as to physical connection, which is of particular interest, was made by the Railroad Commission of Oregon relative to connection between the systems of the Bell and Home companies in Hotel Oregon, Portland, Oregon. The Home company had a private branch exchange switchboard in the hotel with 426 stations connected to it, and the Bell company also had a switchboard having 45 stations connected with it. Guests at the hotel could talk from their rooms to any subscriber of the Home company but, if the persons they desired to converse with were subscribers of the Bell company, it was necessary to go to the Bell telephones, located in the lobby, hallway or other public or semi-public place. After considering the question carefully and holding full hearings, the commission ruled that the telephone companies must maintain facilities and make all necessary regulations for the interchange of business between their respective systems at the hotel.

### Standard Accounting Systems.

The accounting departments of telephone companies having annual operating revenues exceeding $50,000, have been engaged during the year in putting into effect the uniform accounting system promulgated by the Interstate Commerce Commission and made nominally effective on January 1, 1913.

Various state commissions have been engaged in the work of providing standard accounting systems. Among the states which now have such systems are Wisconsin, California and Indiana. South Dakota is preparing a uniform accounting system and Arizona has had the matter under advisement.

### Investigation of Inductive Interference.

An investigation of great importance to the telephone industry was started by the California Railroad Commission in December, 1912, when a joint committee was appointed to take up the question of inductive interference between high tension power lines and telephone and telegraph lines. This committee, composed of engineers representing the telephone and telegraph companies, the power interests, the railroad companies and the railroad commission, has been engaged during the year in an extensive series of tests.

In a progress report covering the work of this committee up to September 1, it was stated that the study had developed into an investigation of much greater scope and complication than was originally anticipated, and that no investigation of the complicated phenomena under consideration has heretofore been undertaken on a scale comparable with that of this work, either in magnitude or in the matter of thoroughness.

The committee declared that, while the complications of the problem appeared so great as to make extremely difficult the drafting of general remedial measures, which shall not be onerous to the interests involved, and shall not be subject to so many exceptions and alternatives as to make them ineffective, it was expected that, with sufficient time and financial assistance, the work can be made to serve as a basis of rulings by the railroad commission that will be helpful to all interests and which will in future reduce harmful agitation, legislation and litigation.

### Standards of Telephone Service.

A notable attempt has been made by the Wisconsin Railroad Commission to formulate and establish standards of telephone service. As a result of a conference between the commission and about 50 representatives of telephone companies operating in Wisconsin, a set of uniform rules and service regulations was considered and taken under advisement by the commission.

### Government Suit Against the Bell Combine.

The notable action of the United States government against the Bell telephone monopoly was launched in July by means of a suit filed by the United States Attorney General in the United States District Court at Portland, Ore., under the Sherman anti-trust law. This action against the American Telephone & Telegraph Co. and subsidiary and allied companies in the Pacific Northwest is being conducted by Constantine J. Smyth, acting as assistant to the attorney general.

Hearings before a special examiner have been held in various cities in the West and Northwest, in Chicago and

in the East and a record thus secured of the testimony of prominent Independent telephone men and others throughout the country, respecting the telephone situation as a result of the practices of the Bell system. This testimony will constitute a portion of the records of the United States District Court at Portland in this case.

### Telephone Investigations by Governmental Bodies.

In addition to the activities of the U. S. Department of Justice in instituting the anti-trust suit against the Bell company, the Interstate Commerce Commission has started an investigation of the business of telephone companies. A list of questions was sent to every telephone company in the United States having an income of $50,000 per annum or over. From the replies to these questions, the commission expects to obtain the salient facts connected with the telephone business. Another kind of investigation was also started by the commission, that of making a valuation of the physical properties of the telephone companies of the country which do an interstate business. Considerable interest is attached to this work, not only from its value for rate making purposes, but also in view of the recent agitation for government ownership of telegraph and telephone lines.

During the year the Department of Commerce and Labor has been actively engaged in taking a census of the telephones of the country for the year 1912. This work is done in compliance with the act of congress, passed June 7, 1906, which provides for a census of telephones to be taken every fifth year. All farmer and rural telephone lines, or commercial companies or systems are included in this census. The last census of this nature that was taken, was for the year 1907.

During the latter part of the year there has been considerable agitation looking to the acquiring and subsequent operation of telegraph and telephone lines by the government. Although no definite announcement has been made, it is understood that the administration at Washington was seriously considering the question and looking into the methods by which government ownership of telegraph and telephone lines might be brought about. A bill, providing for government ownership, has been introduced in Congress by Representative Lewis, but it is not expected that definite action will be taken on it, owing to the recently announced policy of the A. T. & T. Co. in making its long distance lines available to the Independent telephone companies.

### Automatic and Semi-Automatic Telephony in Europe.

During the past year the tendency of telephone development in many parts of Europe has been along automatic and semi-automatic lines. In England arrangements were made for the installation of several new automatic exchanges. Facilities for communication from points in England to various points on the continent were extended during the year.

In France, the Administration of Posts and Telegraphs has given much attention to automatic telephone systems. A Strowger system of 2,800 lines has been installed by the French Thomson-Houston Co. at Nice. The exchange was cut into service about the first of November and is understood to be operating satisfactorily. In general, however, semi-automatic rather than full automatic equipment is preferred. In Angers and Marseilles the government is installing a new automatic system of the Western Electric type. It is reported that plans are also being made to instali the same system at Roubaix and Tourcoing. During the year the administration has standardized the apparatus to be used for all common battery installations. Iron sets with micro-telephones have been adopted as standard. It is proposed to designate a certain type for each piece of apparatus which will be known as the Administration type.

In line with the general commercial awakening, the people of Spain are commencing to use the telephone and great progress has been made in the past year in introducing common battery equipment. Among the places which have adopted this system are San Sebastian, Barcelona, Pamplona and Valencia. All the common battery installations in Spain have been furnished by the Western Electric Co.

Although a new tariff on the measured rate basis was officially adopted many months ago in Belgium, the government has been unable to put it in force for lack of equipment. There have been no automatic exchanges installed during the year but four new common battery exchanges are being installed at Brussels by the Western Electric Co. The toll and exchange equipment throughout all of Belgium is being increased with a view to taking care of the additional number of subscribers which it is confidently expected will follow as a result of the adoption of the new tariff.

The municipality at The Hague, Holland, is installing two new exchanges of 2,000 lines each, of the Western Electric automatic type. It is stated that in these exchanges the subscribers may have either full or semi-automatic service. The municipality of Amsterdam has ordered another semi-automatic exchange from the firm of Siemens & Halske. From this it is evident that the semi-automatic system has made a good impression upon the people of Amsterdam, as this was the first city in Europe to try out a system of that type. Included in the budget now before the state parliament at The Hague is a credit of $800,000 for the installation of an underground cable to connect Amsterdam, The Hague and Rotterdam. The cable will be of the Pupin loaded type.

In Switzerland an exhaustive study was made of automatic telephone systems and the general director of telegraphs has decided to install a Western Electric semi-automatic system at Zurich, which is the foremost industrial city in the country. The first office to be installed will have an initial equipment of 8,000 lines and it is planned to install two other offices of equal size within the next two years. In all the other cities, the Swiss administration will continue to follow its policy of installing common battery systems for all exchanges of 600 subscribers.

The automatic equipment is gaining a strong foothold in Germany. In Munich, 10,000 lines of full automatic of the Strowger system have been installed. Among the larger semi-automatic installations is that of 4,000 lines in Posen, the equipment being that of Siemens & Halske.

In Rome, Italy, a 4,000-line full automatic branch exchange of the Strowger type, has been installed.

Throughout Europe automatic private branch exchanges are being adopted by some of the largest business concerns.

# Convention Plans of National Independent Association

**Provision Made for Discussion of Various Topics of Interests—Analysis of Bell Agreement Most Important of Topics—Declaration of Principles Recommended by Board of Directors to be Thoroughly Discussed—Exhibit Arrangements**

The 17th annual convention of the National Independent Telephone Association, which will be held at the La Salle Hotel, Chicago, on January 13, 14 and 15, promises to be an important meeting in the history of the association because of the live topics which at this time compel the attention of Independent telephone men.

### Analysis of Bell Agreement.

While the program committee of the association has arranged for speakers on a number of topics of interest to all in the telephone industry, yet the committee recognizes that the topic which overshadows all others, is the new situation created by the agreement as to interchange of toll connections made by the American Telephone & Telegraph Co. and the attorney general of the United States. Each telephone manager is anxious to know how the agreement will apply to his peculiar situation. The committee has taken this into consideration by arranging for a general discussion by men of different views and viewpoints, and by providing time for a general conference.

Manford Savage.

As announced in the last issue of Telephony, among the subjects it is planned to have discussed are: State Commission Control; The Jurisdiction of the Interstate Commerce Commission Over Exchange Rates and Service; Local Ownership of Exchanges; The Independent Manufacturer; Telephone Exchange By-Products; and The Interstate Commission Reports.

One feature of the convention will be a full discussion of the declaration of principles announced by the board of directors on December 15. This declaration is necessarily brief, but at the convention, all things therein contained will be brought out so fully that all may know just where they stand. The directors believe that there is meat in every statement of that declaration and that every clause in the declaration may well form the subject of a discussion of the most vital interest to every telephone man. The officers of the National association declare that it must be understood that the association is making no fight on either men or associations who differ from them, the good faith of all who are trying to help the Independent cause being conceded. Any difference is as to methods, and nothing of a personal nature will come up at the convention. Having complete assurance that the National association is permanent, looking only to the benefit of thousands of stockholders in Independent telephone companies, those identified therewith stand for those things which will insur permanency in the telephone business. Special benefits, it is disclosed, must be subordinated to the common good and temporary advantage must give way before conditions that can be made lasting.

### The Exhibit Arrangements.

The same generous space accommodations for the manufacturers' exhibits, committee rooms and general meeting hall that were provided at the Hotel La Salle last year, have been secured for this convention. The reservations for space by manufacturers and dealers in specialty supplies has been most gratifying, insuring that this department—one always of interest—will be more attractive than ever. Every important telephone manufacturer and supply dealer will have exhibits at the convention, as usual. The latest in all types of telephone equipment will be shown.

The benefits to be derived by every operating telephone man from a study of these exhibits and a face to face talk with the experts in charge of them, forming as they do an exposition in itself, can hardly be over-estimated. The construction man will find new devices and suggestions that will interest him. The wire chief will find new apparatus for use in his department. For seventeen years some of these manufacturers have been exhibiting at the annual conventions of the National Association. Their faces are those of old, old friends, but the apparatus they show is modern and right up to the minute of 1914.

This will be a convention for every man connected with the Independent telephone industry, no matter in what way he may be connected with it, no matter in what special department his interest may lie.

Telephone history is being made these days. More of it will be made at this convention. All are invited to come and have a hand in the making of it.

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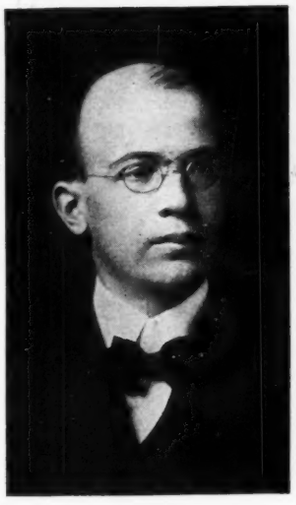
**Adopts Telephone Train Dispatching as Strike Weapon.**

In anticipation of the strike of 1,100 telegraphers employed on its lines, the St. Louis & San Francisco Railroad on December 28, says a Springfield, Mo., dispatch, laid off indefinitely 400 telegraphers and began to transform its telegraph lines into a telephone system. Removal of all telegraph instruments from the company's offices began at noon and was completed late at night. The means adopted was a surprise to telegraphers, shippers and railroad circles.



C. E. Tarte.

F. B. MacKinnon.

P. C. Holdoegel.

L. D. Kellogg.

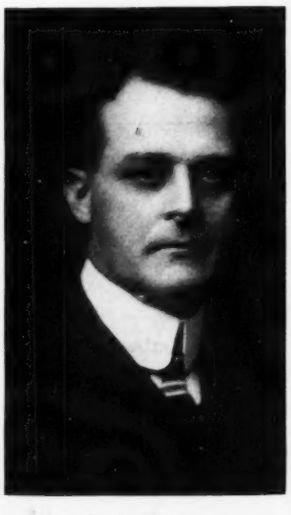
H. C. Todd.

## An Invitation

You are cordially invited to attend the Seventeenth Annual Convention of the National Independent Telephone Association, to be held at the Hotel La Salle, Chicago, January 13, 14 and 15, 1914. The man who comes to this convention will see and hear things not covered with the dust of years gone by, nor depreciated by the accumulation mold of the past; but, resplendent in the light of today, you may see the latest triumphs of invention and, in the sunshine of the now, will be reflected actual existing conditions which foretell better times than were ever known for the telephone man. It will be a convention of optimists believing in PROGRESS—PROFIT—and PERMANENCY. COME!

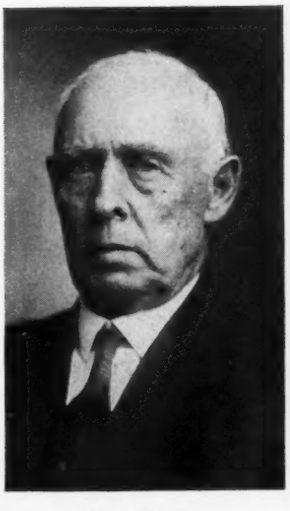
NATIONAL INDEPENDENT TELEPHONE ASSOCIATION.

C. Y. McVey.



J. B. Earle.

H. D. Critchfield.



W. J. Thomas.

W. G. Brorein.

# Think and Become an Optimist

## By HERBERT KAUFMAN

Not much room for the pessimist nowadays. We're too busy setting things right.

Once upon a time we spent all our odd moments criticising providence and railing against destiny. But we're beginning to realize that providence and destiny have been saddled with burdens of injustice—blamed for commissions and omissions for which we were personally responsible.

Most of the troubles of mankind are home-made; half of our afflictions are the penalties of indifference, and ignorance, and neglect.

Once we set our minds to the amelioration of any condition, we generally manage to effect the improvement. Our talents may be circumscribed, but in face of recent events who dares to definitely locate the last boundary of civilization?

The twentieth century has already proven the fairy god-mother of the ages. Nothing seems to astonish us; we are quite prepared for any revelation. Inventions and discoveries, which would have echoed through a former decade, stir our interest today and are commonplaces tomorrow. We live more history in a month, than Dr. Johnson witnessed in his lifetime.

Of course, lots of things are still wrong, but at the rate we're correcting our bad habits, it won't take many years to transform the universe into a sphere that our ancestors would find considerable difficulty in recognizing as the "old home."

Romance may be dying, but common sense is accomplishing miracles where theatricality and sentimentalism picturesquely failed.

Here and there a long ear or a high-brow bewails the "spirit of commercialism," but if it has become a business world it is also a business-like world. All our ideals are not commercial, but we are applying commercial methods to our ideals. We act promptly, move efficiently, talk less, do more. We are organizing and establishing order where hair-brained theory futilely ranted.

If we are less religious than our forbears, we are practically reverent in a hundred directions where they were complacently obtuse. We may not be devoting as much attention to the hereafter, but we are certainly doing far more to extirpate present sources of suffering and to dig up the earthly roots of evil.

The millennium has by no means arrived; moral laxity prevails broadcast; too many men are rich and too many are poor; sweatshops, tenements and brothels lift their ugly faces in every city; child labor sullies the honor of a republic; graft, political crookedness and crime in all the aspects enthuse the pessimist, but Tammany is out of the saddle; the red lights are fading; Beilis, the Jew, stands free by the grace of God and the efforts of the Christian church; loan sharks, quack doctors, mail order swindlers are marching jailward in a steady procession; Pennsylvania has a eugenic marriage law; the prison contract system is all but obsolete; the penitentiary is ceasing to be an institution of revenge and is metamorphosing into a hospital for sick souls. What do you expect in a hurry? We can't unbungle society in a week. The important thing is that every week is signalized by a radical step in the right direction.

The nineteenth century passed into the maw of eternity, leaving us with a staggering heritage of conscience debts.

We're liquidating our obligations as fast as we can devise plans to handle them. If we merely maintain our present average of reform, the next ten years will turn society topsy-turvy. Quit croaking!

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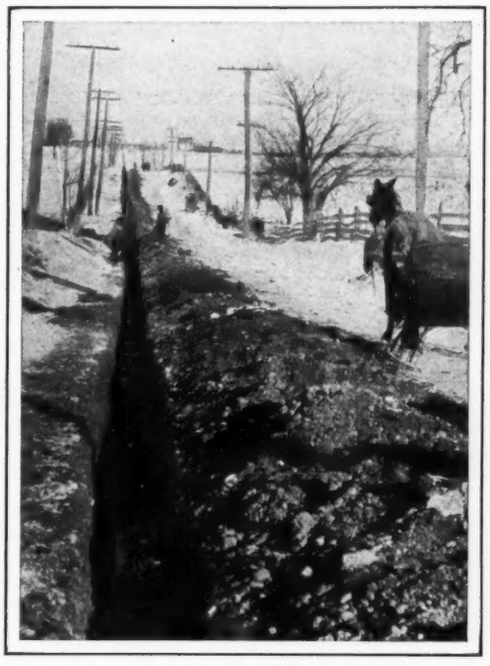
# Digging the Trench for Wilmington-Washington Conduit

**Methods Used in Construction of a Section of the Boston-Washington Underground Subway—Adapted from Address Before The Telephone Society of Baltimore—Reproduced With Illustrations Through Courtesy of The Transmitter, Baltimore, Md.**

By P. W. England

The Wilmington-Washington subway is one link in the chain of subways which now unites all our large Eastern cities.

As early as the year 1905, the American Telephone & Telegraph Co. laid underground conduit from New York to Philadelphia, and The Bell Telephone Co. of Pennsylvania continued it south to Wilmington, Del. Here, however, it stopped, and it is doubtful if we should yet have a completed subway through to Washington, had it not been for the severe sleet storm of March 4, 1909—the storm that marked the inauguration of President Taft and completely isolated Washington from the outside world. There is little doubt that this storm materially hastened the completion of underground construction to Washington, for hardly a year after its occurrence, work was actually started on the preparations of plans for the extension of the subway from Wilmington.



Laying Conduit Under Difficulties.

The route follows the old post road as far as Baltimore, and is a very direct one. The legends of the past tell us that this route was originally an Indian trail through the woods, and that over it, in Colonial days, the stages plied between Philadelphia and Baltimore. The route was selected, not so much because of the territory traversed, as because of its directness.

For convenience in carrying on the work, the territory was divided into three geographic divisions, the first, known as Section 1, extending from Wilmington to the Susquehanna River—32 miles; the second, Section 2, from the Susquehanna River to Baltimore—33½ miles, and the third, Section 3, from Baltimore to Washington—29 miles.

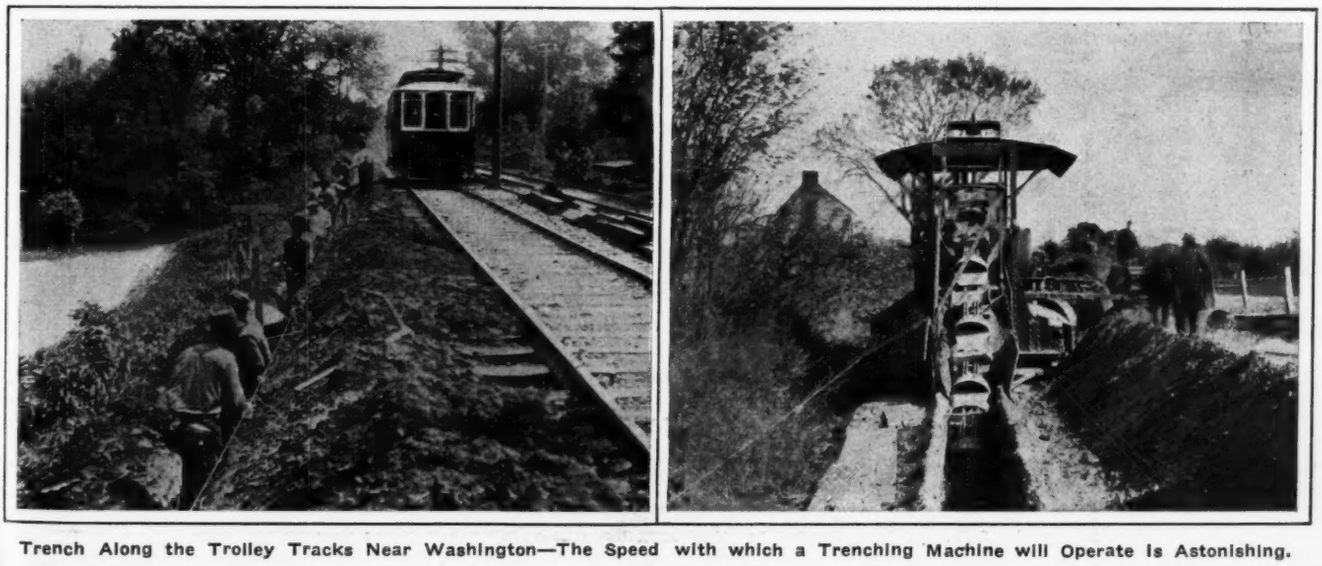
Securing rights of way for the subway, traversing as it does two entire states, was an undertaking of no mean proportions. This work was delegated to the legal department of the American Telephone & Telegraph Co., represented in Philadelphia at that time by George H. Warren, special agent, now your rights of way superintendent.

The laws of Delaware and Maryland are such that property owners abutting on highways own in fee to the centre of the road. Therefore, rights and permits had to be obtained from all abutting property owners, and, in addition, from all municipal and county authorities.

By energetic work, all necessary permissions were secured in time. With nine construction gangs on different portions of the work at one time, completing more than a mile of subway a day, you will readily understand that the rights of way department was kept decidedly busy.

In order to save time, two gangs of six men each, were placed in the field to obtain data for the preparation of plans and drawings. Speaking of these preliminaries reminds me of the time when the boys were in need of a drafting table and had to improvise one of a rather novel character.

They were staying at a roadhouse at Relay, run by a good-natured old German named August Wauhouse, or "War Horse," as they called him. I happened to be there

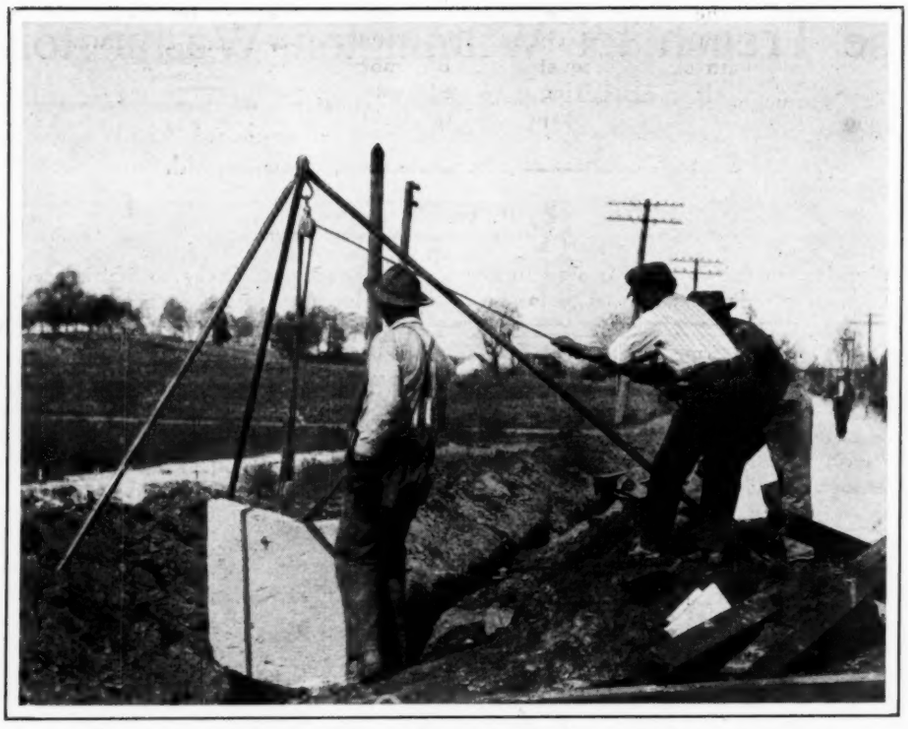


Trench Along the Trolley Tracks Near Washington—The Speed with which a Trenching Machine will Operate is Astonishing.

at the time and went out into the yard to see what I could find. Suddenly my eye lighted on the very thing—the old man's barn door. I asked him for it immediately. At first he objected with a good deal of heat.

"My barn door? No you don't," he said. "I ain't going to have you tear my barn to pieces to make drawing boards."

He was finally convinced that we wouldn't damage the door and that it would be put back again in exactly the same condition. So the huge door was carried up to the big room under the roof, which had been turned into a drafting room. We propped it up on a couple of saw horses, and there was our drafting table.



Assembling One of the Sectional Concrete Splicing Boxes Used in Subway.

Preliminary survey plans to the number of 66 were made by these men. In addition the draftsmen prepared drawings of the bridges—about 75 of them. The survey was started at Wilmington, April 25, 1910, and was completed June 2, a total of 36 working days. Field notes were worked up during the evenings and on rainy days, but the final drawings were not completed until the parties returned to Philadelphia.

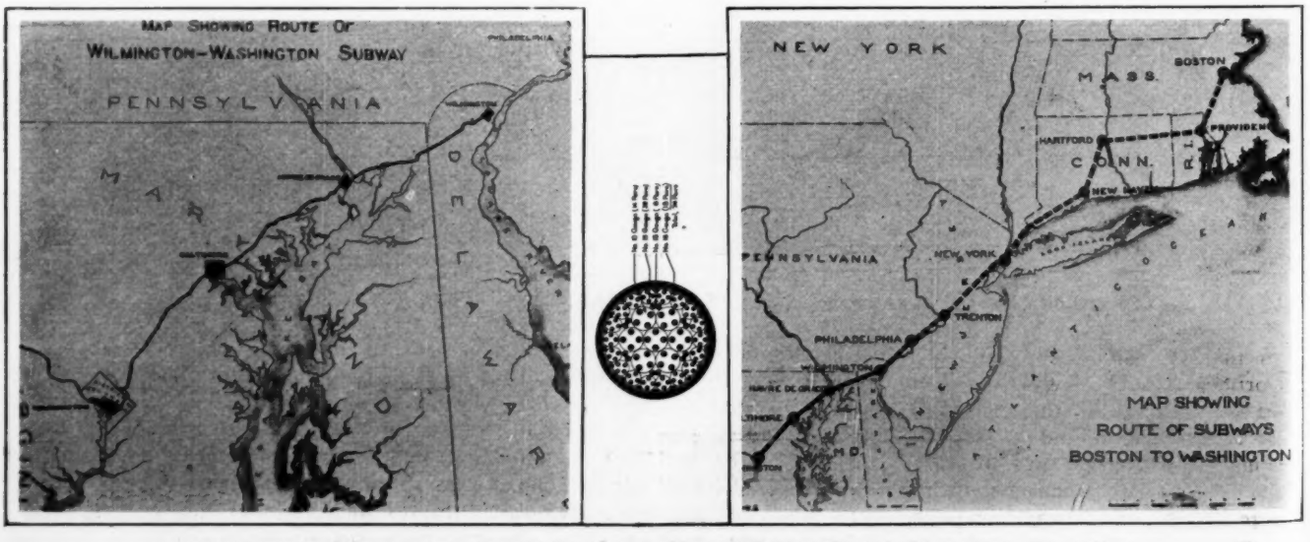
The work was done by contract, at a unit price per trench foot of conduit laid, and a unit price per splicing box assembled, prices covering everything except the duct itself and the splicing boxes, both of which were furnished by the telephone company. To insure rapid completion, the work was divided among three contractors—one for each geographical section. Awards were made strictly on a competitive basis, the lowest bidders receiving the contract. As only reliable firms were asked to bid, the method proved very satisfactory.

Ground was first broken on September 15 at the Wilmington end, and a few days thereafter on the other two sections. Within a couple of weeks each contractor had three gangs at work, with about 50 men in a gang.

The engineering forces were organized as follows: In each gang an engineer and one assistant were placed, whose duties were to lay out the location of conduit and splicing boxes and to furnish lines and grades. A section engineer was placed in charge of each geographical section with its three gangs. He had direct supervision over the gang engineers and was responsible for all work in his section. The section engineers reported to the supervising engineer in Baltimore. The total force comprised between 25 and 30 men.

The very starting point of the subway was the trench at the southerly boundary line of the city of Wilmington, Del. The location selected for the conduit was about midway between the edge of the traveled road and the gutter.

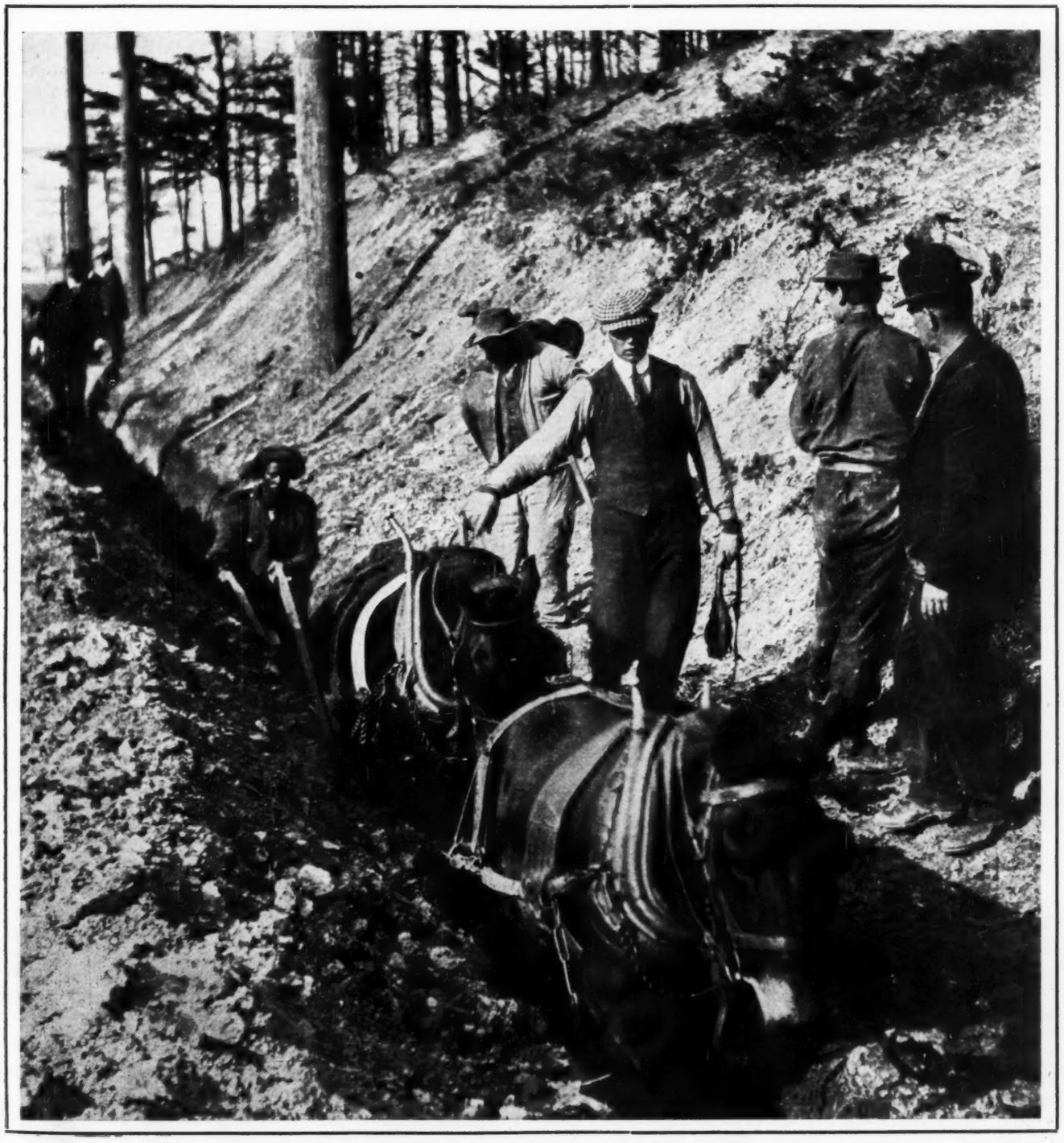
About 12 miles southwest of Wilmington, lies the steep and rocky hill known as Chestnut Hill, over the crest of which for a mile or more runs the subway. Ledge rock, as well as boulders, were here encountered in considerable quantities. The rock gang drilled holes for blasting, placing logs over them to prevent loose stones from flying about.




Route of the Subways from Boston to Washington and Diagrammatic Cross Section of Cable.

The first severe snow storm of the winter came near closing down the work in this vicinity, and did close it down on the other two sections south of the Susquehanna River. The contractor for Section 1, however, having only about eight miles to go to finish at that time, kept his gangs together, and despite the bad weather, completed his portion of the work by January 7.

Passing now across the Susquehanna River to a point in Section 2, about midway between Havre de Grace and Baltimore, we find one of the gangs at work under decidedly adverse conditions, back-filling the trench preparatory to closing down for the winter. With snow on the ground to a depth of six inches and the thermometer well below the freezing point, you can readily appreciate the difficulties under which the gang labored, and it is needless to say that only in cases of extreme necessity should subway work be attempted under such conditions. The back-filling is almost sure to prove unsatisfactory, because the excavated earth freezes and becomes mixed with snow, and after the first thaw, the trench is likely to resemble a quagmire.



Sometimes the Teams Worked Better in Tandem, a Mule and a Horse Working Together.

The three gangs in the first section started work between September 15 and 30 and finished by January 7. This made the average time for each gang 78 days, or 13 weeks. As a total distance of 32 miles was covered, the average length of subway completed each week by all three gangs, was about two and a half miles, and the average rate of work per gang per day was 718 trench feet.

South of Baltimore, the route of the subway follows the Baltimore-Washington turnpike, a state highway paved with macadam for more than half its length. The state authorities permitted us to occupy this highway, only on condition that burlap be spread to keep the dirt off the oiled surface of the macadam. The burlap, obtained in strips eight feet wide and several hundred feet long, was spread down before excavating the trench and furnished the desired protection to the highway.

One Plan of Attaching the Conduit to Bridges—Ducts Surrounded by Creosoted Lumber Box.

As one passes along the route, it is interesting to notice the different types of laboring men. In Section 1, the Italians alternate their silent, steady labor with the voluble, excited chatter that breaks forth at mealtimes and during all interruptions to the work. In Section 2 were Swedes and Polacks, who never seemed to arouse into any sign of attention; and in Section 3, the negroes—the typical negroes of the South. They labored with praiseworthy zeal when the keen eyes of the foreman happened to be looking their way, but let him turn his back and they promptly relapsed into their naturally slow, lazy movements. They seemed irrepressibly light-hearted, these Southern negroes. One could always hear an undertone of joking conversation, chuckling laughter, or droning melody. They were more like happy children playing at having to work, than the weary, joyless day laborer to which we are accustomed in other sections of the country.

At the town of Hyattsville, the subway diverges from the Baltimore-Washington turnpike to the right of way of the electric road, thence to the district line, about two miles south, it runs parallel with and close beside the track. This path provided a much more direct route than the highway, and possessed other distinct advantages—one being that the highways which the subway would have to follow were not at standard grade.

The passage of cars interfered but little, if any, with the progress of the work. Indeed, in one particular the cars proved of advantage, for they afforded an easy means of transportation for engineers, inspectors and foremen from one gang to another. Creosoted wood pipe and other materials were hauled out on flat cars at night and deposited along the line.

At some of the cuts, temporary scaffoldings were erected to retain the dirt thrown out of the trench. To back-fill under such conditions proved an easy operation, for when the planks were withdrawn, the earth dropped by its own weight into the trench. If for any reason it was necessary to deposit earth between the rails, burlap was first spread down to keep the earth from mixing with the ballast.

The extreme southern terminus of the subway was at the boundary line of the District of Columbia, where it connected with the conduit of the Chesapeake & Potomac Telephone Co.

Creosoted wood pipe was chosen as fulfilling all the requirements of this particular type of subway construction. It was laid without protection of any sort, not even the usual creosoted plank on top, except where the subway traversed cities or towns. To omit the covering plank was a deviation from the generally accepted practice, but the reasons were sound and the saving to the telephone company amounted to some thousands of dol-

After Laying Conduit, the Trench was Back filled, Using a Scraper.

lars. As to the size of the system, four ducts were deemed sufficient to meet all present and future needs.

In place of the ordinary manhole of brick or concrete, a so-called "sectional concrete splicing box," oval in shape, with buried cover, was used. This type also involved a departure from standard practice. Inasmuch as the subway traversed long stretches of open country, the engineers at first proposed to eliminate manholes altogether and bury the cable splices directly in the ground, or in a creosoted wooden box about two feet beneath the surface. After careful consideration, this proposition was abandoned and the sectional concrete splicing box was proposed and used in place of the buried creosoted wooden box.

The splicing box is 3 ft. wide by 4 ft. 6 ins. long, with a head room of 3 ft. under the roof. It is built of 17 blocks or slabs of concrete, some of them reinforced. Each side is composed of two covered slabs. The end wall is built of five blocks. The roof is a reinforced concrete slab, four inches thick, constructed in two pieces, with a circular cover, also of reinforced concrete.

The radical features of the box are: (1) buried cover, which eliminates an iron casting; and (2) manholes can be manufactured at one central point and shipped out ready to assemble. The saving in cost over the ordinary brick or concrete manhole is $15 to $20 each.

The splicing boxes were manufactured in Baltimore by the telephone company and shipped from there in carload lots to points along the line. For the purpose of manufacture, a vacant building was rented in the southern portion of the city and a small electrically operated, concrete mixer installed.

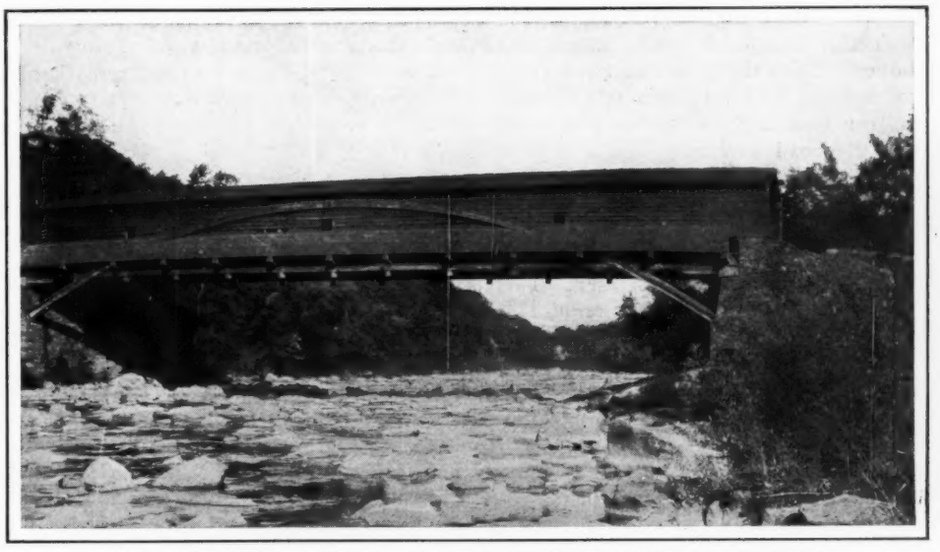
The total number of splicing boxes manufactured was about 1,100. They were turned out at the rate of from 20 to 25 a day. The number of men employed at the plant was upward of 45 during October, the busiest month.

The roof and cover of the splicing boxes were set 12 inches below the road surface, so as to be completely buried. This may cause one to wonder how the splicing box can be found, when it is necessary to dig it up, but the question is easily answered. A concrete monument or marker is placed at the side of the road near the fence line to indicate the location of the splicing box. The figures above the horizontal line designate the number of the splicing box; those below, its distance from the monument in feet and inches.

For lowering the side slabs into position, a light tripod was employed, and as the weight of a side slab is about 315 pounds, a device of this sort proved of great assistance. As a rule, four men were required to assemble a splicing box. Three boxes a day were considered a good day's work. This does not, of course, include digging the hole, but does cover the back-filling.

Various machines and mechanical appliances were employed by the contractors to expedite the work and reduce its cost. As a matter of fact, there were four distinct types of the mechanical methods employed in digging and filling—first, the plow; second, the trench machine; third, the road scraper for back-filling; and fourth, the roller, both steam and horse-drawn, for compacting the back-fill.

Examining these methods in the order named, we have first the plow, which was employed extensively on Section 3, between Baltimore and Washington, to loosen the soil and save the men the labor of picking. The mules used developed much agility and skill in maintaining a foothold along the edge of the excavation. When a pole set close to the trench barred the way, the mule on the other side would step obligingly down into the trench past the pole and then back again to the bank with almost human intelligence.



View of Another Bridge Crossing—Rocks, Not Floating Ice, in River.

Sometimes the team worked better in tandem—a mule and a horse working together. The mule was always placed in the lead, being evidently the more intelligent of the two. In general, I found it to be true that mules were more dependable than horses for this class of work.

The top soil was, of course, the most difficult to break up. It was packed hard at many points along the highway and a man frequently had to ride the plow to get it to take hold at all. This operation required considerable skill. Such cost data as were compiled, indicated that the use of the plow resulted in a distinct saving in the cost of excavation—as much as 10 or 15 per cent.

But the plow proved too slow for the contractor in Section 1, who, several weeks before starting the work, installed two trenching machines of the latest design. These were used with considerable success. The speed with which a machine of this type will excavate is truly astonishing. I have frequently seen it dig at the rate of three linear feet a minute, which will equal 180 feet an hour, or 1,800 linear feet a day of 10 hours—about one-third of a mile. That is "going some," but the machine did not average that rate for the two months it was operating, because of breakdowns, bad weather, moving from one location to another, and so on. Figures for a period of 30 days show that the cost of machine excavating is only slightly less than hand labor.

In Section 3, the earth was placed back in the trench by means of an ordinary road scraper, after the conduit was laid. This was used to push the earth into the trench and deposit it on the duct in a 6-inch layer. Each layer was then rolled and compacted by a concrete roller. Several trips back and forth along the trench were usually required to shift the earth to the edge of the excavation. This type of scraper proved efficient and economical, and was admirably adapted to the class of work for which it was employed.

The concrete roller for compacting the back-fill was

composed of concrete and weighs about 800 pounds. An outrigger was used to guide the roller and prevent it from overturning. After a 6-inch layer of earth had been scraped into the trench, the roller was drawn back and forth several times to thoroughly compact it.

Another method of compacting the back-fill used extensively by the contractors on Sections 1 and 2, was as follows: After the conduit had been laid in the trench, six inches of earth were shoveled in and thoroughly tamped. Then the balance of the earth was filled in without tamping and mounded up. Finally a traction engine was run back and forth over the mound until it was level with the road surface.

Decidedly the most interesting engineering problem of the work, developed at the bridge crossings, of which there were no less than 75.

On the bridge over White Clay Creek, not far south of Wilmington, iron pipe was used. This is one of the few bridges where iron pipe was required. It is well to avoid its use if possible, as the iron deteriorates by rust unless kept well painted. In this instance, the spring freshets rose to such a height as to submerge the decking of the bridge. Consequently the strongest construction possible was employed.

On the bridge crossing the Pennsylvania Railroad at Beacon Hill, Md., creosoted ducts were suspended at the side by hangers. The conduit is placed in this position to allow the necessary clearance or head room required by the Pennsylvania Railroad Co. for the passage of trains. The ducts are surrounded by a wooden box of creosoted lumber.

The highway bridge spanning the tracks of the Pennsylvania Railroad near Oakington, Md., represented one of the most difficult problems we had to solve. The conduit could not be suspended beneath the floor beams for lack of head room, nor attached to the side members of the structure. For a time it seemed as though the only practicable method would be to bring the conduit out of the ground at the approaches and lay it on the flooring of the bridge close to the side members in the space ordinarily occupied by the wooden guard rail.

Drawings were prepared along these lines, and the conduit would have been laid thus, had it not been for the ingenuity of one of the section engineers, L. E. Deckard, of the American Telephone & Telegraph Co., who conceived the entirely novel and original design that provided for the suspension of the conduit at the side of the bridge, entirely clear of the side members, by means of I-beams used as cantilevers.

### The Boston-Washington Subway System.

Allusion has been made to the greater subway system of which the Wilmington-Washington subway is one link. This system now connects the cities of Boston and Washington, about 450 miles distant from each other. The part of the subway between Boston and Providence was completed about the year 1906 by the American Telephone & Telegraph Co. The part between New Haven, Hartford and Providence was completed about two years ago.

The cable, which has been installed in the subway, is of unusually large gage and high transmission efficiency. It is what is known as "duplex" or "quad" cable, and contains 74 pairs of various sizes, the larger ones phantomed so that each double pair forms three telephone circuits and eight telegraph circuits.

The small wires are used for telegraph service between the cities along the line. On the 74 pairs of wires, it is possible to conduct 99 simultaneous telephone conversations, and at the same time to send 296 telegraph messages.

At the present time two trunks are in use between New York and Washington, using the phantoms in the No. 10 quads. It is interesting to note that on account of the construction of the cable and the method of loading it, the service between Philadelphia and Baltimore is practically as good as between two local offices in Philadelphia.

Some of the circuits are so efficient from a transmission standpoint, that when the cable is entirely completed through to Baltimore, it will be possible to give good commercial service over the entire 450 miles of cable. This is a rather remarkable accomplishment when one remembers that, not so many years ago, it was difficult to obtain good transmission through a comparatively few miles of cable.

### "The New Freedom."

Under the foregoing title an extremely interesting booklet which points out the application to the telephone industry of the principles of industrial freedom annunciated by President Wilson in his article on "The New Freedom" in the World's Work, has been issued by the Federal Telephone & Telegraph Co., of Buffalo, N. Y. It is written by John D. Wells, a prominent Buffalo newspaper man, now at the head of the Federal's publicity bureau.

The booklet briefly points out how the industrial welfare of America came into jeopardy through the formation of trusts, and reviews the effects of monopoly methods. The anti-trust plank of the Democratic party in 1908, declaring that "a private monopoly is indefensible and intolerable," is then quoted as the first official recognition of the trust menace. The warnings of President Taft against the prevailing tendency and the partial remedies of his administration, and the subsequent words of President Wilson are reviewed. The dawn of the new liberty, it is declared, is attended by a revival of conscience that insures, to all who try, a fair reward for effort, and growing room for regulated competition that plays fair and breeds economy and efficiency. Nowhere, it is held, do the benefits of competitive merit stand out as plainly as they do in the telephone industry.

The book then tells in an interesting way of the invention of the Automatic telephone by Strowger, a Kansas City undertaker, after central operators had been bribed to divert business to one of his business rivals, and of his struggles to finance the invention, which was made difficult by reason of the fact that the financial interests appealed to, feared that the device, if successful, would jeopardize the securities of existing systems.

The success which finally attended the introduction of the automatic system is, however, now well known. In Buffalo, President Hubbell was skeptical as to the utility of the system, but within two months after a trial installation was made, 16,000 people had petitioned the company to install the automatic and the company is now finishing the engineering feat of building a complete automatic telephone exchange for Buffalo at a cost of approximately $1,000,000, while keeping the manual system in operation.

### Bell Action Does Not Affect Pension Plan.

The separation of the American Telephone & Telegraph Co. and the Western Union Telegraph Co. will not affect the pension plan recently announced for the benefit of 175,000 employes of these companies, according to a recent statement by President Vail. Mr. Vail also said:

The telephoning of telegrams to the telegraph companies and the delivery of telegrams by the telephone companies will continue. This existed before the American Telephone & Telegraph Co. took any interest in the Western Union. The Postal Telegraph Co. has always had the same facilities afforded it that the Western Union has.

# The Best Business on Earth

### The Telephone—All Share Losses—Need of Constructiveness

By J. C. Kelsey

"The time has come," the walrus said,
"To talk of many things;
Of shoes and ships and sealing wax
And cabbages and kings."

Of course, you are familiar with Alice in Wonderland. You must be, because you live in the wonderland of business.

You are in the telephone business, the wonder business of the world!

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In the question of quality, the telephone business leads. In the quantity, you have fourth place.

In the line of quantity, we have the following list:

1.—Iron and steel.
2.—Lumber.
3.—Gas.
4.—Telephone.
5.—Cotton.
6.—Liquor.
7.—Printing.
8.—Wool.
9.—Clothing.
10.—Implements.

Is it not a proud position? And consider the age of our business.

We have had the clash and roar of iron and steel way back of the crusaders. The lumber industry has given us homes ever since man dared to leave his cave. We have had gas as a servant of humanity before you and I were born.

---

The telephone was born in 1876, and it had a stunted growth for practically 23 years. It had fallen into the hands of short sighted men.

But its emancipation came later, and no servant of humanity ever took so much advantage of its liberty.

Think of exceeding cotton, and above all, liquor. And clothing, printing and farm implements. All in practically fifteen years!

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Our business was born of trouble—and it looked for many years, as if it were "of few days." It hardly "came forth as a flower," neither was it "cut down"; yet no business ever went through such a travail of war.

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As sturdy men are born of sturdy necessities, so has the telephone business been developed into a sturdy business.

A telephone man told me, in confidence, that if business had been any other than the telephone business, his company would have been ruined long ago.

This man was not an Independent telephone man either. He came from a territory where there had been a fight—and such a fight too.

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It is no wonder that our financing affairs ran into awkward angles. No financial house or institution cares to finance a fight, even though the fight is for a good purpose.

In war, the paramount idea is the destruction of men and property.

Does it seem reasonable to expect men or investors to look favorably upon anything in the nature of destruction?

When you succeeded, your competitor failed.

Look at it from every angle. Do you know where there are two successful telephone plants in one city? Either one or the other is a sufferer and a loser, if the truth is admitted—and the losers are not Independents by any means.

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If there is anything the financial world fears more than Asiatic cholera, it is a loser. A loser is the most pitiable object that crosses the horizon of our vision of life.

We are proud of successes, but oh! how we run from failures! We dread them so.

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It has been fully shown that our old ideas of war are wrong. It was once said that war made business good.

Today we know that America suffers for the sin of the Balkan war. Far off among the hills of Southern Europe, thousands of miles from us, are these warring elements.

Yet their affairs are our affairs. The destruction of their property and lives affect us.

We who are in peace, are paying the bills of those engaged in war. We are paying the cost of the Balkan war.

You feel it. I feel it, and not one escapes.

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And so it is in our commercial warfare. You whip your competitor, and put him in the losing class.

You merely make other people pay the bills and you pay your share too. Of course it is a sort of an indirect tax—and Americans hate direct tax.

We all know that paying useless bills gets us nowhere. We know that property destroyed must be paid for.

You paid the losses of the San Francisco earthquake. You paid the losses of the Baltimore fire.

Don't think for a moment that an insurance company paid it. They are only a collection agency, engaged in collecting the money from you.

---

If we could just see clearly that each war or fight only heaps the coals of expense upon our heads; if nations could only arrive at this conclusion in the conduct of their affairs, and dismiss our picket lines, our skirmish lines, sharpshooters and battle lines, and men of war.

Think a moment what it is costing Europe, and the United States too, to maintain navies and armies.

The losses which could be inflicted upon a weak and defenseless nation will never equal the current cost of maintaining a war footing capable of avoiding war.

In other words, preparation for war is more costly than war.

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Now apply it to telephone matters. The cost of being prepared for war has cost us hundreds of thousands of dollars.

Just consider the patent business alone—and then consider the cost of a press bureau: The number of men engaged in furnishing newspapers with biased information; keeping the public mind prepared so that if war breaks, that much will be gained.

And think of other expense, all useless and idle, simply because we have not sense enough to turn the sword into a plowshare.

---

England had a 30-year war. We have had a 15-year war,—not the "War of the Roses" either, but the war of the telephone.

We have seen free service, cut rates, law suits, injunctions, appeals and denials—everyone costly.

We have seen newspapers crowded with news, every line of which dealt deadly blows to the telephone business.

You have seen TELEPHONY doing everything in its power to offset what has appeared in the papers, trying to counteract the effects of the poison injected into the public mind.

You have seen very little constructive effort because constructive efforts were ahead of the times and were not understood.

Now what are the present day effects? You, who have spent

weary weeks in New York, or Chicago, or St. Louis and other centers of finance, trying to raise money to develop your properties, you always met with evasion or rebuff.

In the mind of every financial man you talked to, there was a war picture, reeking with ruin, carnage and woe—and he passed you by, because war means expense and destruction, not profit.

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It did not matter whether the telephone war had stopped in your own locality; it did not concern the financial mind that your local conditions were ideal, but it did concern him, because general conditions were not ideal, that there still was war somewhere.

What he wants, and naturally what you want, is peace—a cessation of war, a beginning of harmony, etc. Then you will find development money.

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The best business on earth! The wonder business of the world! The telephone business!

It has survived a long and withering ordeal. It has proved itself by the long recorded test of the survival of the fit.

It is in a class somewhat the same as France when confronted with the German demand for three billion war indemnity, which Bismarck figured would take 30 years to pay. They reached down in their banks and in 24 hours had the enraged Germans marching back to Berlin. It angers them yet to think of their modesty.

Likewise, the telephone business can reach down into its banks of experience and other valuable assets and in 24 hours can show you its fitness.

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The telephone has no competitor. You know of no substitute for it.

Gas competes with electric light. When gas improved, electric light took an activity and gave us the tungsten lamp.

Thus, today we have a contest between amber gas lights and tungsten electric lights. The steam railway finds its parallel in the cheaper electric way.

So many enterprises are fighting for an existence which can be snuffed out in a moment by sudden, although expected, improvements.

The telephone stands alone—it has no immediate rival—we all have to talk. Never again will silence be golden!

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So many financial houses have intimated that the telephone industry has no stability—nothing but poles, and wires, and a telephone on the wall, or desk. How often have I heard that cry!

And then they refer you to a waterworks system, with iron pipes leading over the city. Not a word about the deadly electrolysis which is hourly sapping the life of the pipes.

And railroads with their steel rails, steel coaches and steel bridges, the very echo of stability. Not a word about the terrible wear of rail and wheel. Yet today railroads are on their knees confessing anything but stability.

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Telephone companies today own the choicest real estate in the country. The Bell company is the second holder of real estate—and telephone companies have beautiful buildings. What is more stable than large city real estate, and fine slow-burning or fireproof buildings?

When it comes to the outside plant, there is little left to improve. Tile ducts, set in concrete, thread the principal streets—they are indestructible. In these ducts, are lead covered cables, each containing hundreds of pairs of copper wires.

When the distribution system reaches out beyond the confines of the underground system, the lead covered cables are carried on great heavy poles. Here you have practically the least stable thing, the poles. Yet they are not like ties in a railroad system—they are not subject to abnormal wear.

Everything else is stable, and composed of staple materials. Switchboards and telephones use mahogany, oak, platinum, German silver, copper and steel. What is more stable or staple either?

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The real stability is permanence of utility. The art has progressed to a basis of physical permanency. The question is really one of utility permanency.

As far as we can see today, a telephone system will always be in as much demand as the waterworks and the lighting plants.

And there is another side. The telephone is by nature a living part of a railroad, water system, power system and the business world. Of all the utilities, none has the close and necessary intimacy of the telephone.

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The telephone business has had its baptism of fire. Prior to 1908, we were all fond of saying that hard times would not affect the telephone business.

We did not know that it wouldn't—we only thought so. We know now.

That dread panic hit us in October, 1907, and 1908 was a dull, dreary year for every industry—except the telephone business.

There is no need of my telling you how your collections held up; how you paid your bills; and how you weathered the storm. You have the facts—and need only to rest upon them.

---

If you could be dropped from an aerial vessel; that is, let down into a strange country, almost anywhere on civilized parts of the earth, with a little money in your pocket, you could soon start a successful telephone business.

You could not start a power company, or a railway, but a telephone system would thrive immensely.

No utility has such successful adaptability or utility.

---

I could go on, dealing in millions and billions, but you are not intensely interested in statistics. You are interested more in its achievements.

What other agency has called greater attention to the farm? It has caused the "back to the farm" movement.

In other words, the telephone is saving our children and our children's children from starvation.

---

Prior to the telephone the world was practically deaf and dumb—we used a sign language. The telephone gave us speech and hearing.

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The telephone has concentrated the energy of 50 centuries into 25 years. In other words, the world, aided by the telephone, made as much progress in 25 years as the world made in 5,000 years without it.

"The time has come," the walrus said,
"To talk of many things."

I have talked for many things for four years. I hardly think it is fair for one lone man to persist so long.

Many of you are in convention, or on your way. You never make a turn without seeing something from my pen. Really I am sorry for you.

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Yet there are so many things as the walrus said, which must be talked about, even though it would be wiser to keep still.

Someone has to hew the wood and draw the water. That I have tried to do and greatly to my disadvantage.

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I want to remind you that we are in a serious business, and to remind you that within the next two weeks, you are going to meet in two conventions.

I counsel you to be moderate and reasonable both in speech

and action and to realize that in unity alone, do we accomplish the greatest good.

Let us put away the grievances of the past, let the past bury its dead, and with open mind, face the certainties of the future.

The advantage is in your hands. Use it!

MORAL: Opportunity does not knock often.

**New York Company Fails To Furnish Information.**

The Public Service Commission of New York held an adjourned hearing at New York City, on December 22, in its proposed general investigation of rates and earnings of the New York Telephone Co., insituted as a result of the application of W. H. Winkler for a universal five-cent rate for Greater New York, and of the application of Harrison B. Weil, for lower P. B. X. rates. Numerous organizations interested in the hearing had representatives present.

John L. Swayze, general counsel of the New York Telephone Co., informed the commission that he could produce no figures showing the gross income of the telephone company.

"New York City," he continued, in response to a credulous inquiry by Chairman Decker, "is just a part of a section served by our company, and the only way we could get at it would be by a method of apportionment. I have no idea whether we are making or losing money in New York City." He also declared, in response to the commission's inquiries, that he did not know what the company's gross earnings were in the Bronx or in Westchester.

Commissioner Decker questioned the Bell company's attorney insistently and declared the commission could not proceed with the hearing without the information desired. Asked by Chairman Decker as to the gross amount of capital invested by the company, Mr. Swayze replied that he would furnish the number of subscribers and the number of extension telephones, but that this would be shown in the different classification of subscribers. "The percentage of net earnings to actual investments," he declared, "can only be obtained by an inventory and appraisal of the property."

Commissioner Decker said he did not think so, and that if the company knew what it had invested the commission was entitled to know it. Mr. Swayze said he would produce the amount paid for real estate each year, with certain modifications, as well as the cost of underground cables, but added that he could not tell the administrative expenses of the company, because that could only be reached by a method of apportionment. Regarding certain questions the commission had asked at previous meetings, he said his company was in doubt that it should allow to be known broadcast certain business information of the company.

Questioned as to the contract for the payment of 4½ per cent of gross earnings to the American Telephone & Telegraph Co., Mr. Swayze could give the commission no information as to this arrangement. The commission ordered that this contract and also a contract between the New York Telephone Co. and the Western Electric Co. be produced. Mr. Swayze then added:

"The New York Telephone Co. wants to aid this commission in its efforts to get information and to answer requests regarding rates and charges, but we are confronted by a request to furnish a financial statement. Our books are so kept that we are unable to segregate our reports and tell conditions in New York City alone."

Chairman Decker requested the appearance of Union N. Bethell, president of the New York Telephone Co., on the stand on the following morning. When this session opened it was explained that Mr. Bethell could not be found and a subpoena was thereupon issued for his appearance in the afternoon. The company was also ordered to produce on January 15 a statement showing the gross and net earnings, cost of operation in New York City and surplus income. It was then given until January 5 to show cause why it should not comply with the order.

Mr. Bethell was on the stand on December 23, and when asked if he could give an approximate estimate of the amount of money invested in the telephone plant, entered upon a discussion of the circumstances which he said the commission, as well as himself, were bound to consider before a direct answer could be returned. He insisted that there was no practical way by which a financial statement could be made without apportioning the different accounts, and that even then the statement would be misleading and practically valueless. Though repeatedly questioned, Mr. Bethell would not venture an estimate of the amount invested in the business in New York City. He said that the actual value of the property of the New York Telephone Co., as a whole, was $7,000,000 greater than the book accounts showed.

When asked if he was aware that there was serious unrest in New York City in the matter of telephone rates, Mr. Bethell declared that those complaining constituted a mere bagatelle as compared with the 500,000 subscribers served, and that the general satisfaction given was a source of pride to the company.

He said that the company could not please everybody and that if rates were changed to satisfy one group, another group would take offence and to satisfy everyone would be making a superhuman demand upon the corporation. The witness reiterated that it would be impossible to supply a statement showing the receipts and expenses of the company in New York City, although if possible he would have a statement prepared by January 5 showing what is taken in from private exchanges, pay stations and private telephones.

**Settlement Out of Court.**

"The sensible thing for a telephone company and its patrons to do in any controversy over service is to get together and settle it among themselves."

This is the advice of J. L. Reiley, secretary of the Public Service Commission of Indiana.

"Of course the matter of rates is one the commission must adjust, but mere service complaints are matters for local adjustment and the commission should not be burdened with them, except in rare instances. It is a nice way to settle a problem of that kind for the people and the company to come to an understanding. It is the economical way. When it comes to a kick on service the company is well off that adopts the attitude that the customer is always right."

**Chicago Hotel Lobby Operators to Go.**

The telephone operators in the lobbies of Chicago hotels are being dispensed with through the action of the Chicago telephone company in installing nickel first telephones. The managements of some of the hotels are making objection to this action because they declare it to be impossible for them, under the new system, to check up the telephone receipts, upon which they receive about 50 per cent. Heretofore they had daily reports of the telephone revenue, but hereafter reports will be monthly, with no satisfactory means, the hotel men claim, of keeping a close watch on the receipts.

# The Rejuvenation of the Craneville Telephone Exchange

**A Serial Story Begun in the August 16 Issue, Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery Metallic System and Later to Common Battery**

By Paul Hamilton

"Mr. Barrows, if you don't object, I'd like to go to Mr. O'Malley about that second telephone proposition. He's a pretty good friend of mine. I've been thinking it over and believe I can convince him that he ought to have the two instruments. What you said about the telephone being a door to his place strikes me as argument enough," said Frank a few days after this conversation about the groceryman's service.

"All right, Frank, go ahead. If you want any figures about how many calls are waiting for him, let me know," replied the proprietor. "Here's a blank contract."

"No, I don't need anything I guess. If I have any luck, he will be down here for a contract. If I know O'Malley at all, it will be a rush job. I will be there to see him about half-past nine. I have a job across the street from them that will keep me busy 'til then, so I won't waste any time," Frank replied as he shouldered his tool bag and went out.

Mr. Barrows did not hesitate to grant Frank's request, for he had learned through various channels that the big fellow was to be depended upon, especially when he assumed the initiative. He had persuaded a number of subscribers to sign contracts and, by diplomatic methods, had assisted in inaugurating a general change in the attitude of the public toward the telephone company.

In reality, Frank had given but little thought to O'Malley's case until he passed the store on his way to the office the morning he made his request. As he passed the store he noticed a barrel of syrup standing beside the open door. The remark Mr. Barrows had made about the telephone representing a door to the place, came to his mind instantly and it occurred to him to ask for permission to try his hand with O'Malley.

Soon after nine the customers began to crowd into the store. From across the street Frank maintained a lookout and when he judged the opportune time had arrived, he sauntered across to the store, tilted the syrup barrel, which weighed about 400 pounds, and deliberately placed it so that it blocked half the entrance. Then he walked into the store.

Fortune favored him for, as he entered, Mr. O'Malley was listening to the complaint of an angry customer.

"I tell you, it's a nuisance to have to leave my work and come clear over here because your clerks are gabbing over that telephone. It's busy all the time! My telephone is no use to me, if I can't get you when I want to give my order."

"Really, Mrs. Burns," Mr. O'Malley began rather helplessly. "You know I'm not responsible for the telephone service." Then catching sight of Frank, he called, "Here Frank! Maybe you can explain to Mrs. Burns.

"What's the matter there at the door?" he exclaimed, coming from behind the counter. There was an unusual commotion as the customers pushed and crowded to get in and out past the syrup barrel.

"The same thing that's the matter with the other door. It's choked," Frank answered.

"What other door? What's the matter with the other door?"

"I mean the telephone. It's the best door you've got, if it were big enough."

"Give me a lift on this barrel. Somebody should have had better sense than to put it here in front of the door."

"You wouldn't need much more of a doorway than that, if you'd make the telephone door wider," said Frank as he aided Mr. O'Malley with the heavy barrel. "Mrs.

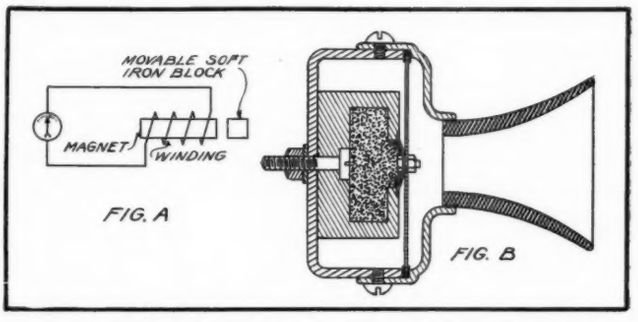


**Fig. 41. Principle of Telephone—Transmitter Construction.**

Burns wouldn't be here for one, and you don't know how many more. I know of two others."

"What do you mean? Another telephone?"

"Yes, and then tell your customers to use them," replied Frank.

"Come in and see me when it isn't so busy in the store," invited the groceryman.

"I'm pretty busy nowadays," answered Frank. "You just think it over, and when you're made up your mind, go down to the office and see Mr. Barrows."

"I think you moved that barrel there," Mr. O'Malley accused Frank.

"Sure!" You made a good guess. I must get back to work. Don't forget the telephone door is too small. So long," and Frank went back to his work across the street.

After listening to several more complaints during the next busy hour, about his telephone being busy, Mr. O'Malley made up his mind to see Mr. Barrows at once.

Mr. Barrows explained the actual conditions to him and emphasized the need of another telephone by saying that it was quite possible some of his cash customers did not always pass the grocery store located nearer their homes, when they failed to reach him by telephone.

As Frank had predicted, there was a rush order for another telephone at O'Malley's.

"I promised him to have it in tomorrow," said Mr. Barrows, as he gave Frank the order.

"Whew! That will be some job. There isn't a spare wire on Maple street," protested Frank.

"I thought of that, Frank, but there are three wires that we can make spare," answered Mr. Barrows. "The telephone in the waiting room at the depot; the one in the rotunda at the city hall; and the one in the hall in the Opera House building are not bringing in any rental. Mr. Rankin says he put them in to accommodate the public. You may use any one of those lines and the instruments may as well be taken out."

"There'll be an awful howl when they are taken out," was Frank's comment.

"Well, we'll have to stand it. I find that the electric company does not furnish a single light gratis—not even

in the city hall. I can't see any reason why we should be so generous. It is the railroad company's business to look after the requirements of its patrons. The Odd Fellows, Masons and Elks can certainly afford to pay for a telephone in the Opera House, if they need one, and the city has five free telephones, as provided for in the franchise. We'll try it out anyway."

"All right, Mr. O'Malley will get his telephone tomorrow," Frank replied.

Frank had learned that when Mr. Barrows decided to follow a certain policy, he invariably was able to support it with logical and reasonable arguments. Although the three telephones mentioned were used but little, he knew that their removal would cause the public to feel that they were being deprived of a great convenience. He was to discover later what the matter would lead to.

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"The Doctor has asked me a number of questions which I have not had time to answer fully, so I have decided to devote the evening to a lesson in elementary telephony. How we talk over the telephone has aroused the Doctor's curiosity," said Mr. Barrows when he met the men at the weekly meeting.

"It is surprisingly simple, although it required years of study and experiment to discover the principle. The idea was developed from the electromagnet.

"The relation between electricity and magnetism is a very deep problem and is only understood through applied mechanics; that is, we know that under certain conditions, we will obtain certain results—results so absolute that they can be determined beforehand by mathematical calculations. Tables, as perfect as the multiplication table, have been compiled, showing the exact results of certain mechanical applications, all derived from the unknown relation of electricity and magnetism.

"It was first discovered that by winding a soft iron core, which in itself is not a magnet, with wire, and that by connecting the ends of the wire to the poles of a battery, the core instantly becomes a magnet and remains so as long as the wires remain connected, or the battery continues to operate.

"Then followed the reversal of this principle. It was found that by winding a permanent magnet and placing a galvanometer in connection with the ends of the wire like this (Fig. 41-*A*), the needle would be deflected by bringing a piece of soft iron in close proximity to the end of the magnet and a deflection in the opposite direction would result upon withdrawing it.

"By moving the piece of iron forward and back rapidly,

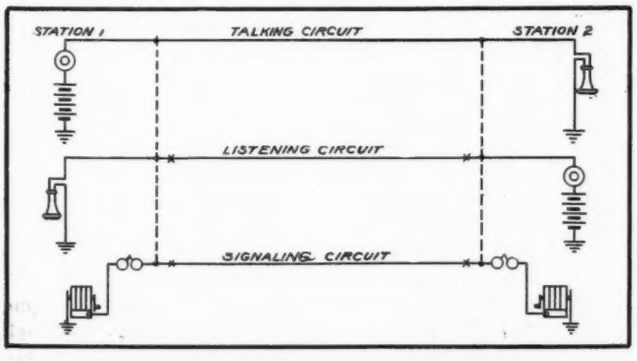



**Fig. 42. The Three Circuits of Telephone Sets.**

the needle of the meter vibrates accordingly. Around these two principles our present telephone system has been developed. This is the working basis. Everything else in connection is accessory to it.

"What we now term a receiver was first designated as a telephone and the symbol, *T*, is still used to some extent to indicate it in drawings. As a further development of the second principle (Fig. 41-*A*), a soft iron diaphragm, similar to the one we use at present, was substituted for the iron block and fixed permanently in front of the magnet or pole piece. A similar instrument was cut into the circuit in place of the galvanometer, and by throwing the voice against the diaphragm at one end, the vibrations of the diaphragm were reproduced in the other instrument, thus forming the sound waves in the air."

"Then the receiving instrument and the one for transmitting were identical?" queried the Doctor.

"Yes," answered Mr. Barrows, "until it was found that their use commercially was not practical. Then came the development of the other principle, that of varying an electric current through the winding of a coil in order to vibrate the diaphragm placed before the magnet."

"But the windings in the receiver are not wound around the permanent magnet," interposed Frank.

"No, they are not. The windings, if placed around a permanent magnet, would have little, if any, effect. The current passing one way would strengthen the magnet and in passing the other way would demagnetize it, but the action would occur very slowly. What we must have, is a core that will respond to several thousand variations per second."

"What is the winding around?" Germany inquired. "It's always a magnet, already."

"It is around a soft iron core. The reason it is always magnetized is because it is in the field of the permanent magnet."

"Then what does the permanent magnet do?" Frank inquired.

"It simply keeps the core under magnetic control or influence," explained Mr. Barrows. "Of itself, the iron core would be magnetized by current passing through the coils, but when the current ceased, it would lose its strength and at the next impulse of current, it would have to become thoroughly saturated again. This process would not take place quickly enough to give the diaphragm proper action. Therefore by combining the two and keeping the core, or pole piece, as it is called, saturated all the time, any flow of current adds to or detracts from its strength or pull on the diaphragm. It responds quickly to the slightest variation of current flow. The diaphragm, being under tension, responds to any change in the power of the pole piece, striking the air, so to speak, and forming sound waves."

"Then the question was how to get absolute control of the current flow through the action of a similar diaphragm set in action by sound waves coming into contact with it?" was the Doctor's inquiry.

"Exactly. It was soon discovered that carbon was suitable for this purpose. It has one peculiarity from any other substance yet discovered. The air apparently forms a cushion around it. A solid block of it introduced into a circuit, offers very slight resistance; therefore the current does not generate heat in passing. The carbon granules, which we use at the present time, are made up of small regular pieces of carbon, and each is a little sphere by itself, surrounded by an air cushion, when not too closely compressed. These air spaces or cushions afford resistance and the mechanism of the transmitter is so arranged that the vibrations of the diaphragm compress and release the carbon alternately, increasing and decreasing the resistance and the flow of current is controlled correspondingly."

"Sometimes the transmitter sticks," said Germany.

"Yes. That is called 'packing.' The carbon granules become wedged in their cell or cup, so that the diaphragm

does not disturb them and no variation of the current occurs."

"Then the diaphragm is not a part of the circuit?" asked the Doctor.

"No. It has no electrical relation. The transmitter is built like this (Fig. 41-*B*): The back electrode, or contact of the carbon container, is the frame of the transmitter and the front contact is a carbon-faced button connected by a small wire to an insulated post."

"When the thing gets too loose or too tight, can't we adjust the sound in the back?" asked Frank.

"It is a delicate adjustment and cannot be done accurrately without the proper instruments," answered Mr. Barrows. "The pressure on the carbon granules is adjusted so that the transmitter offers a certain resistance. The receiver requires no adjustment, as the resistance of the winding does not vary. The diaphragm, however, must be properly placed as regards the poles, so as to get the best results, but that is done in the factory. The invention of the transmitter made the general use of the telephone possible."

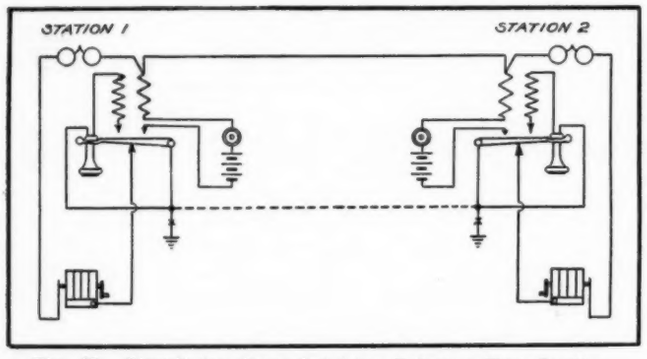



**Fig. 43. Circuit for Grounded Line Between Two Parties.**

"The fellows, who were here putting in the distributing frames, tried to tell me that every telephone has three circuits, already," said Germany.

"That is correct. It may be illustrated like this (Fig. 42). Of course it is unnecessary, as well as impractical, to string three wires between the two instruments or stations. The wire is never in use for any two purposes at one time, so the arrangement like this (Fig. 43) is quite sufficient.

"Here we have the three circuits using the same line wire, but I have added an induction coil."

"It will work without it, won't it?" Frank inquired.

"Oh, yes, certainly. Just like this. Suppose we open two of the line wires in this drawing (Fig. 42) at *x* and connect them by dotted lines like this. You could ring, talk and hear. But the arrangement is greatly improved by the introduction of the coil and switch hook contacts. This circuit shows merely the theory. Coils have come to be such a factor in modern telephony that we will not go into them tonight."

"You have illustrated what you call a grounded circuit, I presume? What is a metallic circuit?" asked the Doctor.

"It is very simple," answered Mr. Barrows. "Take this last drawing (Fig. 43). Instead of depending upon the earth to furnish one side of the circuit, we will put in a dotted line to represent a second line wire, cutting the ground at *x* if we choose. The wire being of so much less resistance than the earth, that path is practically eliminated, except under certain conditions, which we will discuss some other time. This makes a theoretical circuit of it. The best results are obtained by a mechanical modification or re-arrangement of the parts involved."

"But when she goes Z-Z-Z-Z-Z, what ails her?" questioned Germany.

"Asleep and snoring," responded Frank.

"You have drifted into another department. We are not ready to discuss trouble as yet. When we get the principles well established in our minds, many of our troubles will be self-evident. I guess we will give the Doctor his room now."

*(To be continued.)*

**Service Department of Independent Telephone Association.**

At the directors' meeting of the Independent Telephone Association of America, held in Chicago on December 17, it was voted that a permanent service committee be appointed, consisting of not less than nine members, who will devote their attention to matters of the Service Department. The members of this committee will consist of operating company representatives only. Some of the most competent commercial, plant, traffic and accounting men in the Independent telephone field will serve, thus helping to make the Service Department of great value to every member of the organization. Additional members from various parts of the country will be appointed from time to time in order that the association may be familiar with conditions that exist in all Independent offices, and that the various methods and ways of doing business in all sections will be understood by this committee.

There is no doubt considerable valuable information possessed by companies in certain sections of the country that is unknown to companies in other sections, and it is the intention of the association to secure such information and distribute it. The committee will supervise the bulletins to be compiled and distributed by the Service Department; also the course that will be followed in carrying on the work. Careful attention will be given the subjects which will be covered by the bulletins; proper maintenance, inspection of pole line, proper testing of apparatus and circuits, methods of securing new business, and many other important subjects will no doubt be carefully considered. The operating companies are greatly interested in the success of the Service Department. Many inquiries have recently been received and the information requested promptly furnished.

Independent telephone companies desiring assistance concerning operating problems are invited to communicate with the association. It is hoped that all companies will co-operate with the Service Department at all times, and not hesitate in either furnishing or asking for information.

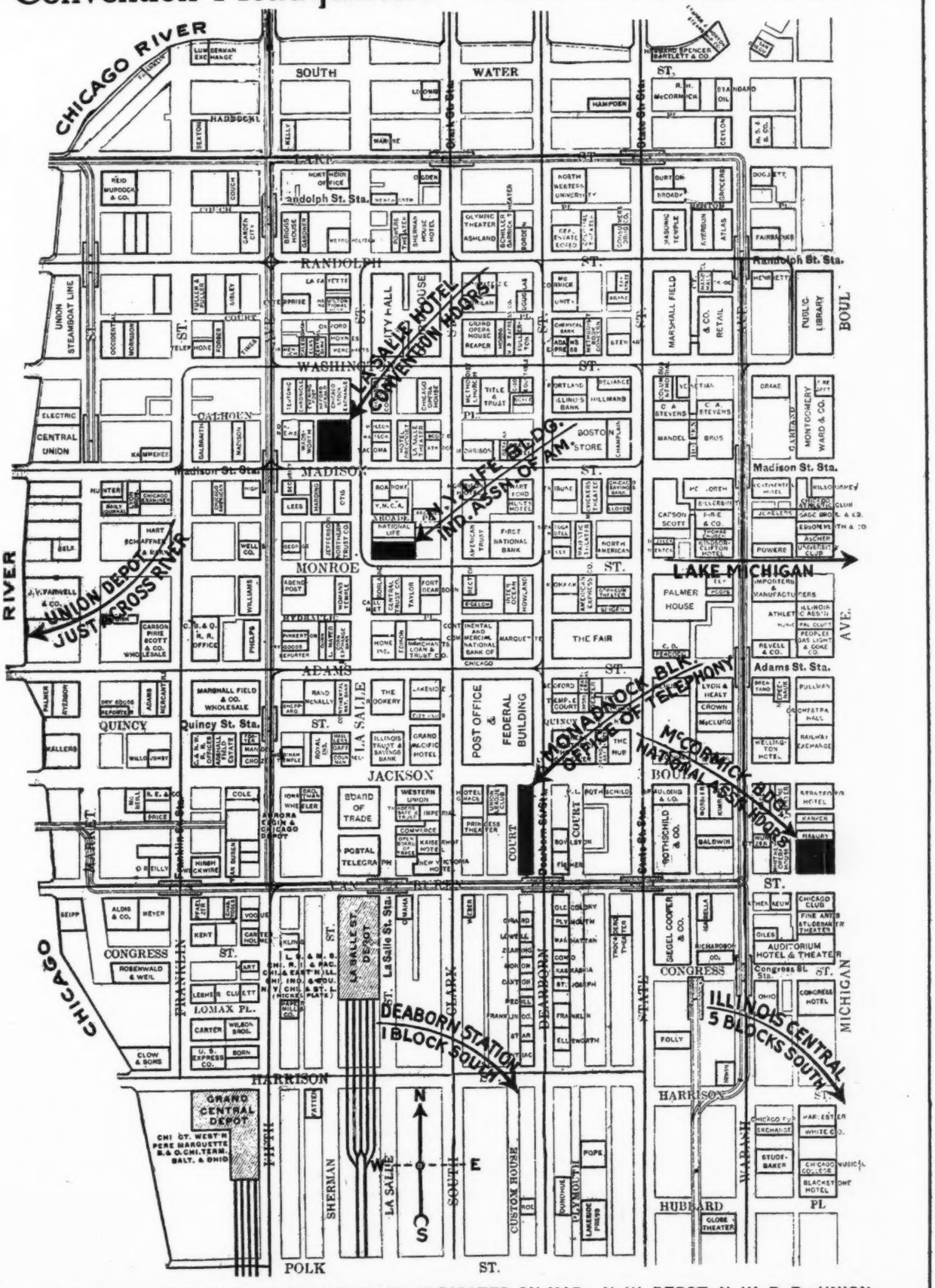
Immediately following the annual convention which is to be held on January 6, 7 and 8 at the Hotel La Salle, Chicago, the Service Department will start active work in aiding Independent telephone companies.

**Enforcement of the Nebraska Female Labor Law.**

A formal written request, signed by 150 patrons of the exchange of the Lincoln Telephone & Telegraph Co., at Tecumseh, Neb., has been presented to the Nebraska Railway Commission asking it to reconsider its "exparte action" allowing the telephone company to close its Tecumseh exchange between the hours of 1 and 3 a. m. The commission had permitted the closing as a solution of the difficulty which confronted the telephone company when the latter was informed by the state labor commissioner that operators must not be kept on duty more than eight hours. It had been the practice for an operator to sleep in the exchange room and to awaken when calls came in, but this was held to be a violation of the new female labor law.

The petition of the Tecumseh subscribers further says that trains arrive and depart during the hours in question and that the closing of the exchange will interfere with fire alarms, calls for physicians and reports to the police and sheriff. The patrons ask that the company be required to employ a sufficient number of operators to keep the exchange open 24 hours in the day. The protest was sent in by the city clerk of Tecumseh.

# Convention Headquarters—How to Reach Them




RAILROADS ENTERING VARIOUS STATIONS INDICATED ON MAP:—N. W. DEPOT, N. W. R. R.; UNION DEPOT, C., M. & St. P.—C., B. & Q.—Penna. Lines—Chi. & Alton; GRAND CENTRAL DEPOT, Chi. Gt. West.—Pere Marquette—B. & O.; LA SALLE ST. DEPOT, L. S. & M. S.—C., R. I. & P.—Chi., Ind, & Sou.—N. Y., Chi. & St. L. (Nickel Plate); DEARBORN STATION, A., T. & S. F. (Santa Fe)—Chi. & West. Ind.—Chi., Ind. & Louis. (Monón Route)—Wabash—Chi. & Erie—Grand Trunk; ILLINOIS CENTRAL DEPOT, Clevd., Cin., Chi. & St. L.—Chi., Cin. & Louis.—Ill. Cent.—M., St. P. & S. S. M. (Soo)—Mich. Cent.

# Proceedings Before Commissions, Courts and Councils

**Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service**

### Detroit Receiving Metered Service Data.

In response to a letter sent out by Mayor Marx, of Detroit, Mich., to the mayors of 21 other cities, Detroit is receiving a considerable amount of data for use in its proposed opposition to the metered service plan of the Michigan State Telephone Co., at a hearing to be held by the Michigan Railroad Commission at Detroit about February 1. The Protective Telephone Association, of Baltimore, Md., has supplied Detroit with the complete data gathered during its investigations.

Mortimer E. Cooley, dean of the engineering department of the University of Michigan, has been retained to assist a special committee of the city council in its investigation of the telephone situation and in the preparation of data for presentation to the commission. The Michigan State Telephone Co. has announced, through General Manager Arthur von Schlegell, that the company will permit an unrestricted investigation of the company's books and property by accredited representatives of the city.

General Manager von Schlegell, of the Michigan State Telephone Co., says that the company has no certainty of making more money under the measured rate than it has made heretofore.

"Our estimate would indicate that our income will increase $120,000 a year," he said, "but it also indicates that 10,000 more telephones will be in use, and these 10,000 telephones carry with them increased operating charges, such as maintenance, depreciation, interest and taxes. If our estimate of the calling rate is correct, our operating expenses ought to show a decrease in the cost per line, but if the estimate is incorrect, the company may not be the gainer. The chance of fluctuation in our business is great, depending, as it does, on all other business.

"The company has been on a 6 per cent. dividend basis, which certainly is not too much for a business such as ours. Courts have held that even 10 per cent. is not too high for earnings of service corporations. Our plant in Detroit has a replacement value of $12,000,000 and is largely new. As for our earnings and their reasonableness, we are willing to have a thorough appraisal of our properties made and our books investigated by competent experts."

"In connection with the showing of $120,000 a year increased earnings under metered service, it should be remembered that the company will have to expend an additional $2,000,000," said Engineer Welch, "If we procured that even at as low a rate as 5 per cent., it would cost $100,000 a year in interest. And then six per cent. has to be charged off each year for depreciation and that would mean $120,000 a year on $2,000,000."

### Hearing in Central Union Telephone Co. Case.

Nine or ten prominent attorneys, of Chicago and other cities East and West, appeared before Judge Dever of the superior court at Chicago, on December 29, on behalf of the defendants in the case brought by the minority stockholders of the Central Union Telephone Co. and urged that "the business of the Central Union be carried on until further order of the court by the company under the control and direction of a board of three persons appointed by the court, one of whom shall be nominated by the complainants, and one by the defendants, subject to the approval of the court." The court was further asked to rule that "all orders and directions in regard to the business and affairs of the company, concurred in by the entire board, shall be binding and shall be carried into execution the same as though such orders and directions were given by the board of directors of the corporation."

After reading the entire plan Judge Dever commented: "That is a receivership in effect, isn't it?"

The defendants in the case, whose plan this is, are B. E. Sunny, Theodore N. Vail, Union N. Bethell, L. G. Richardson, H. F. Hill, Charles E. Mosley and Alonzo Burt, together with three other officers of the Central Union company, who, the complainants charge in their action for a receivership, are "employed or completely dominated and controlled" by the American Telephone & Telegraph Co. The general charge against the defendants is that of conspiracy and manipulation of the affairs of the Central Union in such a manner that the company, which three years ago had no deficit, and now has an annual gross income of about $7,000,000, is, it is alleged, required to pay interest charges on $35,000,000 of Bell money, and is therefore piling up a deficit at the alleged rate of $300,000 a month. The capital stock of the Central Union is $5,450,927, of which the American Telephone & Telegraph Co. owns $5,204,977. Of the difference about half is owned by the minority interests who are pressing this suit as a means of preventing the alleged confiscation of their holdings.

In the course of the hearing Judge Dever listened attentatively to several letters which were read by the attorneys for the complainants. Two letters were from Mr. Sunny to Mr. Bethell, then senior vice-president of the American company. He outlined a plan for having the Chicago company buy the Central Union plant in Illinois. In his second letter dated Feb. 4, 1913, four days before the court proceeding was filed, Mr. Sunny was quoted as writing:

"I sent you yesterday a statement of the Central Union property in Illinois, valued for the purpose of selling to the Chicago Telephone company. I now send you a statement covering the Central Union property in Indiana and Ohio, with figures on the same basis."

These figures show total assets in the three states as $29,609,420. Against this Mr. Sunny set up notes totalling $32,720,000, leaving the Central Union in debt $3,100,000, had the proposed sale been consumated.

### The Merger at Joplin and Webb City, Mo.

An important telephone merger occurring within the last few weeks is that resulting from the acquisition, by the Home Telephone Co., of Joplin, Mo., of the Bell exchanges at Joplin and at Webb City. In the former case the property has passed to the Home company, but actual physical unification probably will not occur until April 1. In the latter case the work of cutting over the wires, making the necessary connections, and transferring the Bell operators to the Home switchboards, was accomplished early in December so quietly and unostentatiously that not a single Bell subscriber suffered an interruption of service.

The Webb City Register states that "the service of the Home company has been satisfactory in the past under a splendid management. The movement to consolidate was hastened by the courteous treatment and manifest interest of both the mayor and city counsellor, and we look forward to a splendid and satisfactory service in the future."

RELIABLE TUBULAR FUSES—WOOD—PORCELAIN.

# Reliable Station Protectors and Terminals

Fuse Wire
Fuse Strip
Fuse Links
Fuse Blocks
Tubular Fuses
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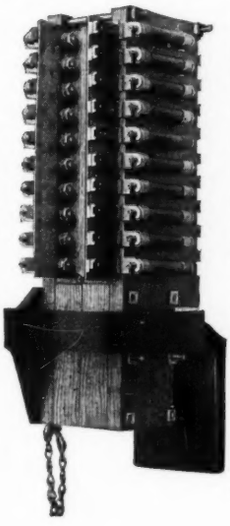
Cable Compound
Protector Strips
Distributing Frames
Lightning Arresters
Baby Knife Switches
Copper Terminal Fuses
Switch Cut-out and Arresters



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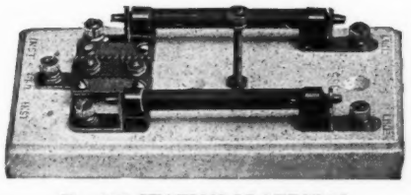
## Type A Terminal

**10 to 25 PAIR**



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**Strong Mechanical Construction**
**Long Life Low Depreciation**
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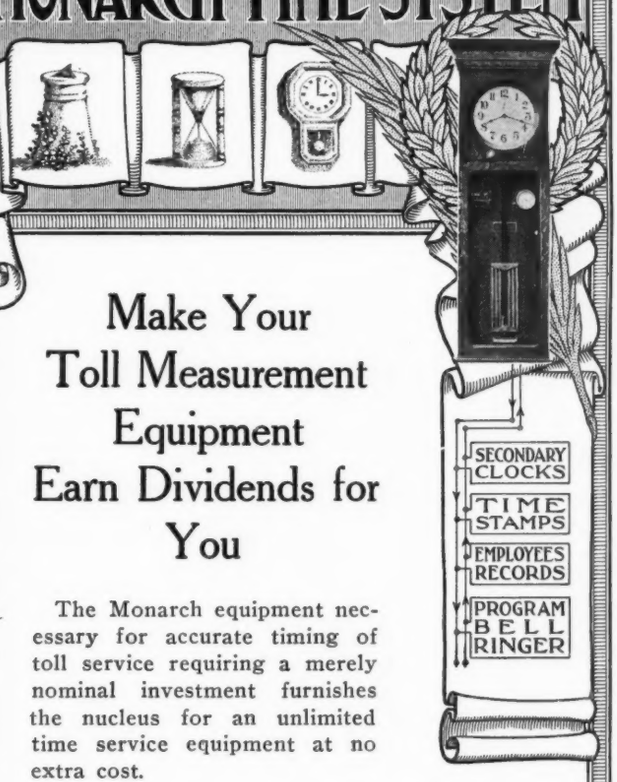
**So-Many in Service Surely Demonstrates Success**

A complete line of telephone and switchboard protection, station protectors, cable terminals will be on display in room 1720. *You are cordially invited.*

## Reliable Electric Co.

*Write for Prices* **CHICAGO** *Send for Catalog*

# MONARCH TIME SYSTEM




## Make Your Toll Measurement Equipment Earn Dividends for You

The Monarch equipment necessary for accurate timing of toll service requiring a merely nominal investment furnishes the nucleus for an unlimited time service equipment at no extra cost.

Selling time service to subscribers is the most profitable side-line that a telephone company can enter. Let us send you complete facts and figures as to what a Monarch installation will actually earn for your company.

## *The One Time System*
### *Especially Designed for Telephone Service*

You realize the vast difference between an old-time hour glass or sun dial and an ordinary clock—

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Every unit—secondary clocks, time stamps, program bell ringers, in-and-out recorders—is controlled by instantaneous electrical impulse from a self-wound master clock. Every unit is operated in unison.

***See exhibit at both conventions.***

## Walker Brothers & Haviland

**1326 Chestnut Street, Philadelphia**
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**Monadnock Block, Chicago**

# Telephone Switchboard Efficiency

## SEMI-AUTOMATIC *vs.* MANUAL

By FRANK B. COOK

To those interested in the financial end of the telephone business, also to telephone engineers, I wish to present a telephone system which, although almost unknown at the present time, is nevertheless destined to revolutionize the telephone business of the world.

You ask what it is and what it will accomplish. It is and will be known as the Corwin Semi-Automatic System. It is a semi-automatic system which may at any time be converted into a full automatic system. This semi-automatic, combining human intelligence with a machine, produces a possible increased efficiency of over six hundred per cent (600%) in local to trunk connections and a reduction in time of the average operator from 16.02 seconds to 2.4 seconds, and possible increased efficiency of over five hundred per cent (500%) in local to local connections and a reduction in time from 14.16 seconds to less than 3 seconds.

This system is *not* limited in its application to multiple switchboards only. It is a *complete system, capable of furnishing every class of telephone service*, and so flexible it may be operated in connection with almost any other known system or type of telephone apparatus.

It provides a real secret service; the operator is automatically disconnected before the two subscribers are connected and cannot thereafter cut in or listen to the conversation. The Chief Operator, Wire Chief and assistants are the only ones equipped to ring up and talk to a subscriber.

The talking circuits are *absolutely balanced*, insuring most satisfactory telephonic conversation, local or long distance. This system permits a subscriber to quickly secure a connection; to *instantly* disconnect and secure another and as many following in rotation as may be desired. He may do this in the middle of a conversation, regardless of whether he is the called or calling party. Each subscriber has control of his line independently of the operator.

*This system can be economically and quickly applied to any existing common battery multiple switchboard, without interfering with its continuous use.* This statement also applies to other switchboards, but to a less degree.

The Corwin Semi-Automatic not only guarantees reduced operating and maintenance expense; it also permits a large portion of existing multiple switchboards and the room they occupy, as well as the space required by operators to be used for other purposes, or it will provide for future growth up to a possible 400% increase.

Likewise where trunk lines are used, a large portion of such trunks are released, and, last but not least, the average subscriber will acknowledge an improvement of several hundred per cent in service.

The argument may be advanced that an automatic machine, which does so much, may not work satisfactorily. Automatic switching machines are quite well known, but no other automatic machine is comparable to ours in simplicity and many other points. It is so simple that any ordinary repair man can take care of it.

Traffic distribution in this system is so arranged that but one call can reach an operator at a time, thus avoiding that nervous strain experienced in present manual operation. This makes it readily possible to secure and retain the relative small number of operators required.

The Corwin Systems are so different in principle that the Patent Office authorities of the United States and many Foreign Countries are allowing broad claims in many of these patents. This in itself is an indication that the system is something new, when we consider the numerous preceding patents. Over one hundred applications for patents have already been filed and others are being filed; the total number will reach several hundred.

The form and method of calculation shown herewith was recently devised by me and the necessary information sought from several hundred Exchanges. An average taken from replies received is here used as the basis of operations on manual switchboards, and using the same figures, I show results it is easily possible to obtain if the same manual switchboard is converted into a Corwin Semi-Automatic.

These figures, which represent such startling results and show Corwin Semi-Automatic to be so vastly more efficient and economical of operation, are easily comprehended when we consider that, instead of many *different* operations being performed by the operator as ordinarily required, a few essential operations only, are performed by the operator; all the remaining operations, which usually consume about 75% of the operator's time, are automatically performed by a mechanical device with almost incredible quickness.

Please understand that the figures used as a basis are not what an operator does in performing operations A, B, C, etc., in rotation but what she *could* do if she performed operation "A" for one minute or one hour, then operation "B" for the same period, then operation "C", etc.

The figures "Operations Per Minute" (used as a basis) may be easily and quickly checked on any switchboard by any operator, with the assistance of one other person to help count or keep time.

It is hardly necessary that I seek to convince you of the accuracy of my figures as it is of sufficient importance for you to *convince yourself*, which you can readily do.

We are now installing a 1,500-line equipment for the Home Telephone Co., at Fort Wayne, Ind., including apparatus for handling troubles, both inside and outside. We expect to commence giving service in January, 1914. They have five sections of multiple switchboards and are working twelve operators. We are installing three positions of Corwin Semi-Automatic with which not over three operators are to handle the work; the twelve positions remain in continuous service during the change and until the Company is satisfied to remove the operators.

I have had over thirty years' experience as a telephone engineer, during the last fifteen years of which I have also been a manufacturer of telephone apparatus, and have, I believe I may say without egotism, achieved in both fields a reasonable degree of success and a fair reputation. Dun and Bradstreet quote me as being financially responsible, to what extent you can easily ascertain by consulting their books. The apparatus, which is all made in my factory, has my unqualified guarantee for efficiency, workmanship and durability, and to avoid any possible question as to patents (I have had large experience in taking out patents as well as in patent litigation) I will also guarantee to hold free from patent liability, any user of Corwin Semi-Automatic.

The Corwin Systems will work great economies in construction by shortening the average length of subscribers' lines. For certain districts it contemplates unattended sub-offices or stations, into which all the subscribers' lines in the vicinity may terminate, with but a small percentage of trunk lines to the Central Office. This service will be so rapid and perfect as to satisfy any subscriber.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

# TELEPHONE SWITCHBOARD EFFICIENCY

Time required to perform the different operations
Connected with handling calls on.
COMMON BATTERY MULTIPLE SWITCHBOARDS

City of _____ Number of Lines _____
Exchange _____ Number of Stations _____

CALLS PER HOUR
LOCAL ____
OUT TRUNK ____
IN TRUNK ____
TOTAL ____

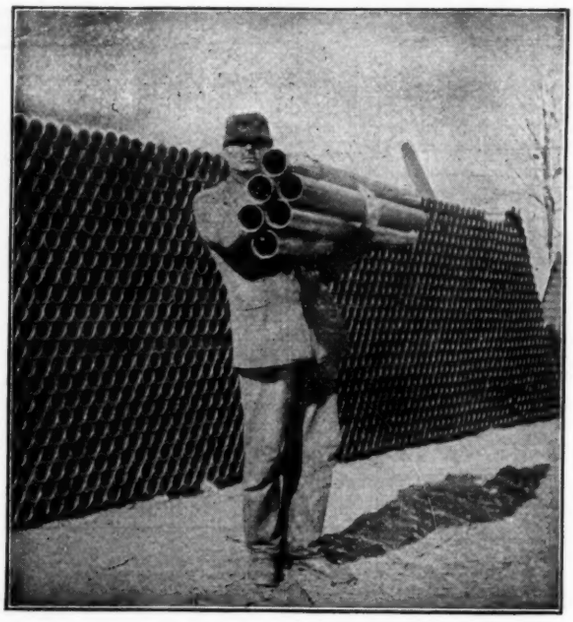
## CORWIN Semi-Automatic System

| OPERATIONS (Omit any operations you may not perform or combine several operations into one if desired) | | Basis of Computation | | Distribution of Percentage and Time | | | | Applied to the same Common Battery Multiple Switchboard using equipment requiring operations as follows | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1-S OPERATIONS | | 1-S OPERATIONS | | 4 OPERATIONS | | 3 OPERATIONS | | 2 OPERATIONS | | 2 OPERATIONS | |
| | | OPERATIONS | | LOCAL TO LOCAL | | LOCAL TO TRUNK | | LOCAL TO LOCAL | | LOCAL TO TRUNK | | LOCAL TO LOCAL | | LOCAL TO TRUNK | |
| | | PER MIN. | PER HOUR | PERCENT. | SECONDS | PERCENT. | SECONDS | PERCENT. | SECONDS | PERCENT. | SECONDS | PERCENT. | SECONDS | PERCENT | SECONDS |
| A | Observe Calling Signal | 75 | 4500 | 5.6 | .800 | 5.6 | 800 | × | × | × | × | × | × | × | × |
| B | Insert Answering Plug | 45 | 2700 | 9.4 | 1.333 | 9.4 | 1.333 | × | × | × | × | × | × | × | × |
| C | Operate Listening Key | 80 | 4800 | 5.3 | .75 | 5.3 | .75 | × | × | × | × | × | × | × | × |
| D | Request Number | 70 | 4200 | 6. | .857 | 6. | .857 | 6. | .857 | 6. | .857 | × | × | × | × |
| E | Subsriber Giving Number | 30 | 1800 | 14.1 | 2.000 | 14.1 | 2.000 | 14.1 | 2.000 | 14.1 | 2.000 | 14.1 | 2.000 | 14.1 | 2.000 |
| F | Repeat Number to Subscriber | 50 | 3000 | 8.5 | 1.200 | 8.5 | 1.200 | × | × | × | × | × | × | × | × |
| G | Depress Trunk Button | 60 | 3600 | × | × | 7.1 | 1.000 | × | × | 7.1 | 1.000 | × | × | 7.1 | 1.000 |
| H | Ask for Trunk Assignment | 50 | 3000 | × | × | 8.5 | 1.200 | × | × | × | × | × | × | × | × |
| I | Receive Trunk Assignment | 70 | 4200 | × | × | 6. | .857 | × | × | × | × | × | × | × | × |
| J | Test Jack of Desired Line | 50 | 3000 | 8.5 | 1.200 | × | × | × | × | × | × | × | × | × | × |
| K | Insert Calling Plug | 40 | 2400 | 10.6 | 1.500 | 10.6 | 1.500 | 10.6 | 1.500 | × | × | 10.6 | 1.500 | × | × |
| L | Restore Listening Key | 90 | 5400 | 4.7 | 666 | 4.7 | .666 | × | × | × | × | × | × | × | × |
| M | Ring Desired Party | 60 | 3600 | 7.1 | 1.000 | 7.1 | 1.000 | 7.1 | 1.000 | × | × | × | × | × | × |
| N | Observe Disconnect Signal | 70 | 4200 | 6. | .857 | 6. | .857 | × | × | × | × | × | × | × | × |
| O | Remove Answering Plug | 60 | 3600 | 7.1 | 1.000 | 7.1 | 1.000 | × | × | × | × | × | × | × | × |
| P | Remove Calling Plug | 60 | 3600 | 7.1 | 1.000 | 7.1 | 1.000 | × | × | × | × | × | × | × | × |
| Q | | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| R | | × | × | × | × | × | × | × | × | × | × | × | × | × | × |
| | Totals | 100 | | 14.163 | | 113.1 | 16.02 | 37.8 | 5.357 | 27.2 | 3.857 | 24.7 | 3.500 | 21.2 | 3.000 |
| Calls per full Hour of 3600 seconds | | | | 254 | | 225 | | 672 | | 933 | | 1029 | | 1200 | |
| " " net " " 3150 " | | | | 222 | | 197 | | * 806 | | * 1130 | | * 1235 | | * 1440 | |

Note
Hourly Period ---------- 100% = seconds 3600
Estimated Supervision 7.5 % 270 seconds
" Waiting Period 5. % 180 seconds 450
Remaining Net Hourly Period ---- seconds 3150

*Note
In lieu of Net Calls which take into account both Supervision and Waiting Period on Multiple Board figures, we have in The Corwin System, figured an added 20% for additional efficiency due to reduced number and variety of operations on part of operator And Quick Snappy Service producing corresponding quick attention and answers from subscribers.
Engineers estimate such additional efficiency up to 40% but none lower than 10%
The above figures do not take into account the Entire Absence of Nervous strain experienced by the operators in present manual operation.

Please tell the Advertiser you saw his Announcement in TELEPHONY.



Carrying 30 feet 3-inch socket joint conduit.

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Made in FOUR STYLES OF JOINTS

*Socket, Sleeve, Screw and Harrington*

WITH BENDS AND FITTINGS FOR SAME

**Is the lightest conduit made**

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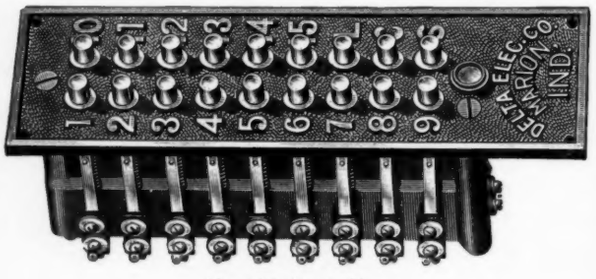


No. 112 Master Key

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Devotes 24 pages, illustrating and thoroughly describing our system. Just off the press.

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# Minimize Your Transmitter Troubles

Insure your service—the most valuable asset you have in seeking new subscribers to your lines. Perfect transmission—free from all disagreeable frying and scratching noises—means satisfaction to the user and added prestige to your lines.

## Andrae Long Distance Transmitters

Have proven their superiority over practically every transmitter on the market. Every feature of their construction shows superiority.

A special metal alloy diaphragm mounted on oiled muslin, insures maximum susceptibility and absolute freedom from trouble arising from dried out and cracked rubber.

Open an Andrae transmitter and compare it with any other make—its superiority of construction will become self-evident.

Send for our catalog and get our proposition.

**ANDRAE** THE HOUSE THAT SATISFIES
MILWAUKEE-WISCONSIN

Please tell the Advertiser you saw his Announcement in TELEPHONY.

According to the contract entered into between the Bell and Home companies in Joplin, the Bell company will have charge of the enlargement of the present Bell building and the installation of the additional switchboard facilities. It is stated that this was done to avoid confusion and that the plans for the extension and outside construction work will be made by the Home company officials. The Home company will employ a large construction force to do the extensive work necessary to be done on the outside physical plants to unite the two systems.

"Much satisfaction is expressed," says the Joplin News-Herald, "over the fact that Theodore Gary, president of the Home Telephone Co., and A. F. Adams, vice-president, will have charge of the Joplin local telephone service. They took charge of the Home company when it was a byword, put it on its feet, and even during the time of the panic were successful in selling its securities to permit enlargement and betterment of the service. Good service and extension of the service to meet the demands of a greater Joplin have always been their policy."

### Morgan Properties to Be Active Bell Competitors?

A Columbus dispatch published in the Cincinnati Enquirer and the Cleveland Plain Dealer states that serious differences are said to have arisen between J. P. Morgan & Co. and the Bell-Western Union interests, which will result in active competition between the Bell companies and the Independent telephone properties in Ohio, Indiana, Illinois and Pennsylvania. It is stated that the agreement of the American Telephone & Telegraph Co. to relinquish its Western Union holdings leaves Independent properties, aggregating millions in value, in the hands of Morgan & Co., probably as a permanent investment, and it is understood to be the intention to go ahead with their development.

### Illinois Commission Appointments.

Governor Dunne of Illinois surprised the politicians on December 30, by announcing the selection, as members of the new public utilities commission, of two Democrats who had not been applicants for the place. The two new members are: James E. Quan, of the grocery firm of J. W. Quan & Co., Chicago, retired, and whom the governor has known intimately for many years; and Walter A. Shaw, of Chicago, who was acting city engineer of Chicago, when Governor Dunne was mayor, and who, for the last few months, has been a member of the state rivers and lakes commission. Only one member of the new commission remains to be selected, the names of Richard Yates, Republican, and Frank H. Funk, Progressive, having already been announced. Mr. Quan will be chairman of the new commission. He was appointed on December 30 a member of the old railroad and warehouse commission and was immediately elected chairman of that body, which went out of existence on December 31.

### Summary of State Commission Hearing and Rulings.

ALABAMA.

January: Hearing on petition of Postal Telegraph-Cable Co. charging the Southern Bell Telephone Co. with discrimination in favor of the Western Union Telegraph Co.

CANADA.

December 22: Provisional consent given by the Ontario Railway & Municipal Board to the application of the Home Telephone Co., of Port Perry, Ont., to extend its lines to Uxbridge, Markham and Whitby. If the extension is made, however, the Home Telephone Co. must take its chance of the connection with the Bell Telephone Co. of Canada, for long distance service, being permanent.

At the present time the board has under consideration negotiations between the Bell company and the Uxbridge & Scott Telephone Co. for the purchase of the latter. The order of the board confirming the purchase is being held in abeyance until February 24 in view of the objections raised by the other local lines that the absorption of the Uxbridge & Scott company by the Bell company would interfere with inter-traffic arrangements between these companies.

INDIANA.

Date not fixed: Hearing on petition of 150 Indianapolis citizens for a merger of Bell and Independent systems in Indianapolis.

MASSACHUSETTS.

December 24: Dismissal of charges that the New England Telephone & Telegraph Co. discriminates against the Postal Telegraph-Cable Co. in favor of the Western Union Telegraph Co., the commission holding "that the evidence would seem to show that the telephone company has, in apparent good faith, for more than a year past endeavored not to permit any discrimination as between the two telegraph companies."

MISSOURI.

Date not fixed: Hearing on motion of Southwestern (Bell) Telegraph & Telephone Co. for modification or setting aside of general order No. 4, which order directs telegraph companies to have same listing and service by number as given other subscribers in the same exchange.

NEBRASKA.

January 13: Hearing on complaint of William J. Marque against the Polk County Telephone Co., involving a change in rates at Stromsburg.

NEW YORK.

January 5: Adjourned hearing in New York City in investigation of the rates and earnings of the New York Telephone Co. in the metropolis.

OHIO.

December 23: Orders No. 607 and 608 authorizing F. B. Smith, C. T. Weedon, J. F. Leeper, and Clyde Leeper, doing business as partners as the Young Hickory Telephone Co., to sell to the company of that name all its telephone property, consisting of exchanges at Ruraldale and Young Hickory and, under construction, an exchange at Philo, Muskingum County, Ohio, with toll line connections radiating therefrom, for $6,000, and the company to issue $3,000 of preferred capital stock and $3,000 of common stock for payment thereof, and requiring the telephone company to file a schedule of reasonable rates.

December 23: Order authorizing the Young Hickory Telephone Co. and the Central Union Telephone Co. to provide a physical connection between the two systems and to file a schedule of rates therefor.

December 29: Order authorizing the Central District Telephone Co., of Pennsylvania, having its principal Ohio office in Steubenville, to issue its capital stock to the total par value of $2,000,000, and that the proceeds of the stock be used for payment on the company's promissory notes to the Bell Telephone Co. of Pennsylvania, aggregating $5,505,625.

January 6: Hearing at Cleveland on the complaint of Harrison B. McGraw against the Cleveland and Cuyahoga Telephone companies.

OKLAHOMA.

January 13: Date of hearing on tentative order requiring companies having agreements with connecting companies for toll messages to make remittanec therefor on the 20th of the succeeding month and to continue present connections until relieved by order of the commission.

January 13: Hearing on tentative order regulating charges for moving or exchanging any telephone, electric, gas or water meter.

PENNSYLVANIA.

January 1: Adjourned hearing at Harrisburg on physical valuation of Bell Company plants in commission's rate investigation.

SOUTH CAROLINA.

December 17: Personal investigation by Capt. John G. Richards, chairman of the South Carolina Railroad Commission, of telephone conditions at Rock Hill, resulting in recommendation that an agrement be reached between complainants and the Rock Hill Telephone Co. setting forth what was expected and what the telephone company would do, and that it be forwarded to the commission for record.

SOUTH DAKOTA.

Date not fixed: Continued hearing in case involving terminal rates received by local exchanges doing a toll business.

VERMONT.

January 6: Adjourned hearing at Montpelier, Vt. in general investigation as to telephone rates and valuations. Almost 4,000 typewritten pages of testimony have already been taken and the exhibits and books offered in evidence weigh almost a ton.

# Practical Subjects—Letters and Discussions

### Fixing Rates for Public Utilities.

By Halford Erickson,

*Member of Wisconsin Railroad Commission.*

Some recent discussions in the newspapers concerning rates charged and service rendered by certain public service corporations indicate that many people are not familiar with the methods of regulation used by the Wisconsin Railroad Commission. Under the public utilities act, passed in 1907, the railroad commission has the power to regulate charges and the character of service of all public utilities in the state, such as gas and electric light companies, water supply and telephone companies, street railways, etc. Cities are not thus deprived of their power to regulate utilities within their borders, although an appeal may be made from the city's orders to the railroad commission; and then again, both the utility and the city may appeal at any time from the commission's order to the courts.

If it be kept in mind that public welfare and convenience are the chief ends of regulation of utilities; and also that the supreme court of the state and the Supreme Court of the United States have laid down the rule that rates, fixed by regulating orders, should be reasonable to both the utility and the company, and that if they can't be made reasonable to both, they must be made so to the public, the essential duties of the railroad commission will be better understood.

The fixing of rates by the commission is based upon cost of service, and that is determined chiefly through the scientific calculation of the property actually used in producing the service. The commission cannot, if it choses to do so, take into consideration a fancy valuation claimed by the owners of the utility in ascertaining actual values. The commission's first duty in any rate case is to ascertain scientifically what is the actual present value of the property, "used and useful" in producing the service—not what the corporation is bonded or stocked for; not what amount the management may have needlessly and recklessly expended in development. Both of these may be grossly out of proportion to the actual present value, which is, approximately, the sum it would take to reproduce the plant in its entirety, less depreciation.

Some recent orders of the railroad commission touching rates will serve to demonstrate the commission's methods. A short time ago an order was issued making a 20 per cent. reduction in the electricity rates for a utility in a certain city in this state. That reduction was ordered because the commission found, on its own initiative, that the company was earning, at the rates in force, an unreasonably high profit upon its investment. The order cuts off more than $40,000 per annum from the company's net earnings (and saves to the consumers an equal amount).

Supposing that the electric company, anticipating the order, had issued a half a million of new bonds, or increased its stock that amount, and claimed that it was entitled to a reasonable rate of return upon its padded capitalization, would the commission have considered the inflated indebtedness? Certainly not! The commission would have determined the value, just as it has done, and estimated the rate being earned on the actual present value, and ordered a reduction, just as it has done, without any regard to the balloon values.

It is true that, in this particular case, the reduction ordered seems like a penalizing of marked efficiency of management, for the big return the company was making was in part due to increased managerial ability. But as the courts have repeatedly held that the public welfare and convenience must always be paramount to that of the utilities, it was the commission's duty to order a reduction.

Another order, recently issued by the Wisconsin commission, made a slight increase in gas rates in a city in the state. The utility was not earning what the courts held to be a reasonable return upon the actual investment. This plant is bonded for $250,000, and has stock outstanding to the amount of $200,000. The owners claimed they had a right to have their rates for gas so increased that they could earn a reasonable return upon $450,000. The commission's engineers and accountants found the actual present value of the property "used and useful" in furnishing the gas, to be about $196,000, and the slight increase in rates ordered will permit the concern to earn only a reasonable return upon about $196,000, which it was not doing before.

To permit many of the public utilities of the state to earn a reasonable return on their balloon values, instead of upon their actual present value, would be to mortgage the future of many a community and prevent a reduction in rates for years to come. That is such injustice to the public which the railroad commission was created to prevent.

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### The Rural Telephone Problem.

In an article published in TELEPHONY of October 4, under the title, "The Rural Telephone Problem," a typographical error was made in the sentence, "It is therefore the only system adopted to give good service with a heavily loaded line, in both signaling and talking." In setting up the sentence on the linotype, the letter "o" was used in the word "adapted," thus changing it to "adopted." The sentence should, of course, have read: "It is therefore the only system adapted to give good service with a heavily loaded line, in both signaling and talking." This correction is made as Mr. Joeckel, the author of the article, fears that some of TELEPHONY'S readers may have misunderstood the meaning of the sentence.

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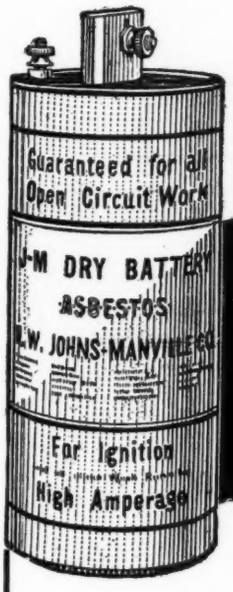
### Letters of a Chief Operator to Her Operators.*

Operator No. 5: It may seem to you that it isn't quite necessary for me to put so much stress on the matter of being kind to the patron; however, it cannot be too greatly emphasized to you especially, for you are very careless in this matter. Kindness and courtesy are invaluable in your work.

You must be kind, for kindness of disposition is almost of as much importance to you as an operator, as is the correct understanding of instructions. Kindness is one of the virtues that never fails to be doubly blessed, for there is nothing like it in the world. Your life as an operator is made up of little things in which kindness and courtesy, given habitually, win for yourself and the telephone company the truest and best friends.

It is impossible for any subscriber to resist continued kindness and courteous treatment. You must always speak courteously and gently, for any expression in an impatient tone will invariably cause the hearer to speak harshly in return. Did you ever think that probably the person whom you are answering, may at that moment be trying with all of his or her power to overcome some angry feeling, and that as soon as your unkind voice reaches them, they storm out at you, probably not knowing what they are saying?

*This is the fifth of a series of original letters written by a chief operator to members of her force and published in the Southern Telephone News.

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If they fail to give absolute satisfaction we'll supply new Batteries without cost, or refund your money, including transportation charges. Do you know of a more liberal guarantee? For sale by most dealers. Shipped direct if your dealer can't supply you.

**Write nearest branch for booklet**

## H. W. JOHNS-MANVILLE CO.

**Manufacturers of Service, Subway and Transformer Boxes, Fuses, Line Material, Insulating Materials, Fibre Conduit, Fireproof Wood, Friction Tapes, Dry Batteries, Lighting Systems, Etc.**

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1937

# DRIVE & TWIST ANCHORS

***Try a dozen—test them***

We claim them to be the most powerful and cheapest to install.

No digging, no screwing—just driven with a sledge and twisted with a bar. The earth above the wide blades is not disturbed but retains its original solidity. That's what makes the Drive & Twist Anchor hold the maximum load without any danger of creepage.

Mail your order for a dozen today. You have the privilege of returning them for full credit if you do not find them better in every respect and much cheaper installed than any other form of anchorage you have ever seen or used.

## The Gund Mfg. Co.

**Gesell Bldg. La Crosse, Wis.**

# The Right Hunch for the New Year?

Don't stop by merely making a "mental note" of this. Start 1914 properly, and satisfy yourself by actual experience that the "VAC-M" is what you want.

Never mind regrets that you have not used this arrester of sterling merit sooner—just make up for lost time by doing it now.

Place your order in plenty of time.

You know what the "VAC-M" is, don't you? You also know what it does; then, there is no excuse for delay.

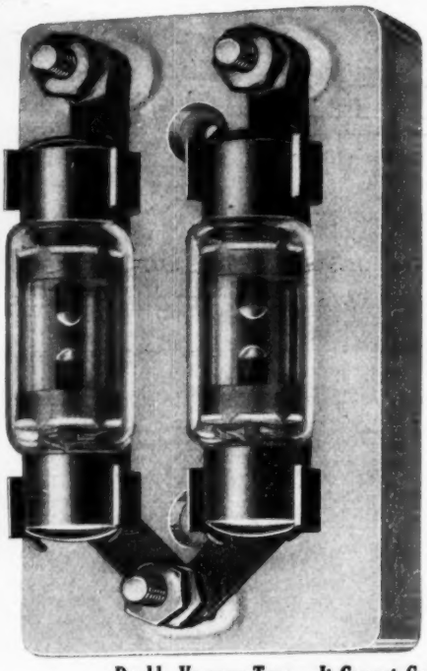
**Get under way!**

## The National Electric Specialty Co.

**Sole Manufacturers "VAC-M" Lightning Arresters**

**H. E. GIFFORD, Jr., Genl. Sales Mgr., Peoples Gas Building, Chicago, Ill.**

**Factory and Main Office Toledo, Ohio**



**WE**

are the Largest Mfr. of High Grade Arresters in the United States.

**WHY?**

Best Made
Finest Material
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Double Vacuum Type — It Cannot Ground
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**Manufacturers of Lightning Arresters, Hydro Grounds, Solderall, Solderall Torches, etc.**

*A Card will bring you Complete Catalogs and Prices*

**L.S. Brach Supply Co., 143 Liberty St., New York**

# Makes Testing Easy

Nothing like it for Simplicity, Accuracy and Durability. Requires no technical education to get results. Can be used by anyone successfully.

T 2062 Peerless Fault Finder

Why is it, that a great many companies neglect to give proper attention to testing?—It is "Efficiency Insurance."—Don't neglect it.

*If you test or desire to, send for Bulletin "GSR-1913"*

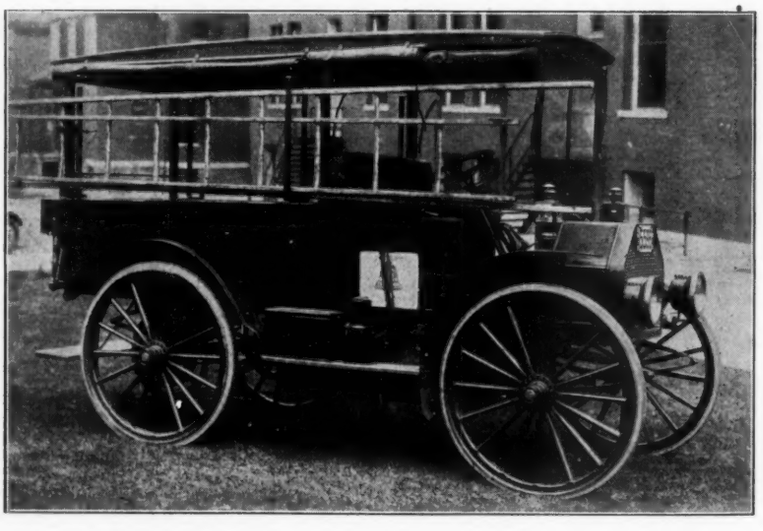
**Thompson-Levering Company**
Philadelphia, Pa., U. S. A.

# When Quick Work Is Necessary

The "trouble" call is a spur to action. Then quick transportation for men and material becomes an urgent need. The company that meets such emergencies more than half way, that takes the best care of its customers, is the one which uses

**Light Running, Speedy, Reliable**

**International Harvester Motor Trucks**



Built with a rated capacity of one-half ton, running at an average speed of twelve miles an hour, climbing any hill, with plenty of road clearance, simple and easily managed as a motor truck can be, economical in running expense and up-keep cost, there is no better truck built for telephone service in city or country.

Any desired style of body can be furnished for use on one chassis. Bodies can be changed in a few minutes. Write for catalogue and full information. Address

**International Harvester Company of America**
**(INCORPORATED)**

**53 HARVESTER BUILDING** **CHICAGO U S A**

Then you blame them for it; your feelings are hurt and you say the subscriber has hurt your feelings. I do not think so. I think you are the one to bear the blame for it.

The telephone can easily become a vexation. When a subscriber places the telephone receiver to his ear, he is expectant, intent and usually in a hurry; and when he is in a great hurry, he feels that he wants to push everything out of his way and get what he wants. You should be very careful in every detail of your work, for in his eagerness and excitement for the thing he is after, the least delay on your part makes the subscriber an enemy forever to the telephone company.

Do not think that it makes little difference if the subscriber is angry with you about something. It makes a very great difference. You must realize that you represent the company, and the treatment a subscriber receives from you individually is the treatment he receives from the telephone company.

After you have once won the confidence of a subscriber through kindness, you may be sure you can always please him. Kindness makes sunshine wherever it goes. You can put sunshine into the minds of each patron that you have with a kind pleasing voice. An operator with a heart full of kindness makes everything around her freshen into smiles. If your heart is full of kindness and consideration for your work, your own voice and the voices of all those whom you hear will soon be kind and pleasant. Even the lights and cords and keys will seem to smile at you as you work.

Real kindness comes from the heart and is felt. What you can effect on the minds of your patrons depends on what you are. It does not require any unnecessary words, or unauthorized phrases, to convince the subscriber that you mean to treat him fairly. You have only to properly apply the company's instructions to your work and you have as good business manners as you need.

Cultivate the proper spirit about your work and put your whole self into what you do. If you are unkind or harsh, your whole effort will fail—the expressions will have no force or influence whatever on the subscriber. But if you will be kind and vigorous, your work will be great; and if any difficulty should arise, the subscriber will feel that he is dealing with some one who understands what he wants and is interested enough to try to get it for him.

### Display Your Interest.

One of the kindest things you can do for a subscriber is to assure him that you are interested in his call. The right kind of service will never fail to do this. I know there are times when you feel that you must stop and reason with a subscriber about something. But you cannot do that, for it isn't allowed, and you haven't time. It is only necessary to remember that the instructions provide a polite answer for almost every question that may arise, which should be answered by you.

You must be able to select the proper expression, repeat it kindly, and it will not often fail to affect the understanding of the subscriber. And usually, when a phrase is repeated in a kindly, courteous tone, it will come nearer making the subscriber see the right side of the cause than any amount of cross reasoning would do, for kindness is the most powerful thing in the world to move men's hearts.

Do not think about your work as being hard and tiresome. Don't dread it, and don't despise the quarrelsome patron. When he complains about his service, there is usually something wrong with it. Even if there isn't—if he is naturally irritable and cross—indifference or unkindness on your part will surely add to his gruffness and probably cause him to be dissatisfied always, even with the best service.

Take kindness for your key and it will fit the hearts of every subscriber you answer. It will not only teach you politeness and courtesy, but will also teach them to be kind to you. The telephone company expects you to attract the public to the use of its service with kind and courteous treatment. You are looked upon as the company when you are dealing with the public, and if the public has a small opinion of you and the service you render, it must have that same opinion of the telephone company for employing you. You must take a personal interest in the work, for whatever friends you win for the company, you win for yourself.

### An Old Trouble Report.

I am also enclosing a copy of an old trouble report that I found among some old papers. It is in letter form, from the operators to the wire chief, as follows:

"Dear Chuck:

Line 41 has been out for three days; line 71 is getting to be a stale joke; Green 202's bell has not rang for a week; F—says Line 39 does not come in; Blue 40, Blue 75 and Main 56 cannot get central one half the time, the light seems to stick; Main 82 flashes: Line 30, Mrs. C. says she cannot get central only when she visits the office; Mrs. M. is raving about Blue 150; people on the 258 line are getting disgusted. Mrs. T., when talking to central sounds LIKE this, LOUD then .

Lovingly,

The Operators.

P. S.—Line 190 just went out, it scrapes and batts and kicks us in the ears. 62-11 and 35 on the pork.

Os."

What would Mr. Barrows do with this in Craneville? If this can be beat, go to it.

Turlock, Cal. L. F. Mershon.

### New Circular of Bureau of Standards.

The fifth edition of Circular No. 6 of the Bureau of Standards, Washington, D. C., has just been issued under the title of "Fees for Electric, Magnetic and Photometric Testing." This circular gives the fees established by the Bureau of Standards, of which S. W. Stratton is director, for tests of electric, magnetic and photometric standards, measuring instruments and materials. It supersedes previous editions of Circular No. 6, and also supersedes the schedules of fees given in the following circulars: No. 17, "Magnetic Testing," December 1, 1910; No. 20, "Testing of Electrical Measuring Instruments," October 1, 1909; No. 21, "Precision Measurements of Resistance and Electromotive Force," March 1, 1910.

Future editions of the circulars just mentioned will be published without the list of fees. They contain information regarding the classes of apparatus to which they pertain and the bureau's methods of testing. Copies of any of them will be sent to interested persons upon request.

### Constable Arrests His Man by Telephone.

George W. Lyons of Los Angeles, Cal., who is known as "the weaponless constable," recently used the telephone in arresting a man, charged with assault and battery. Mr. Lyons believes that arrests can be made in almost every case without the use of weapons. He also believes in carrying out his duty in as inconspicuous a manner as possible, especially where the charges against the party are slight and there is no occasion for "fight" or evasion.

In this case the constable merely got his man on the telephone and explained his position. The man responded in the same spirit and asked what he was supposed to do.

"Come to my office at once and bring a friend with you." came the constable's voice over the wire. The man did so and matters were straightened out satisfactorily to all parties.

# From Factory and Salesroom

**Conventions: Independent Telephone Association of America, Chicago, Jan. 6, 7, 8; Missouri, 6th District, Harrisonville, Jan. 8; National Independent Telephone Ass'n, Chicago, Jan. 13, 14, 15; Minnesota, St. Paul, Jan. 27; Northwestern Cedarmen's Ass'n, Escanaba, Mich., Jan. 27, 28; South Dakota, Sioux Falls, Feb. 11, 12.**

### New Semi-Automatic on Market.

Frank B. Cook is sending out announcements of a new semi-automatic telephone system which is to be known as the Corwin semi-automatic system. In the announcements, it is stated that this semi-automatic system may at any time be converted into a full automatic system. Its operation is not limited to multiple switchboards only. It is claimed that it can be economically and quickly applied to any existing common battery multiple switchboard without interfering with its continuous use and also to other switchboards, but to a lesser degree.

The new system is said to be capable of furnishing any class of telephone service and to be so flexible that it may be operated in connection with any other known system or type of telephone apparatus. The operator is automatically disconnected before the two subscribers are connected and is unable thereafter to cut in or listen to the conversation, the chief operator, wire chief, and assistants being the only ones having equipment to ring up and talk to a subscriber.

Operating and maintenance expenses are said to be greatly reduced, while possible increased efficiencies of over 600 per cent. in local to trunk connections and of over 500 per cent. in local to local connections, are claimed. The Corwin semi-automatic system is said to be so different in principle from other systems that the United States patent office and also the patent officials in foreign countries are allowing broad claims in many of the patents. Over 100 applications for patents have already been filed and others are being filed.

A 1,500-line equipment of this type is now being installed in the exchange of the Home Telephone Co., Ft. Wayne, Ind., and it is expected that service will be given through it this month. At the present time the Home Telephone Co. has an installation of five sections of multiple switchboard and employs 12 operators. The new installation of the Corwin semi-automatic equipment consists of but three positions. It is expected that not more than three operators will be needed to handle the traffic. The old switchboard will remain in continuous service during the change and until the company is satisfied to remove the extra operators.

Mr. Cook has great faith in the new system and gives it his unqualified guarantee for efficiency, workmanship and durability. He will be president of the Frank B. Cook Co., which will succeed the Corwin Telephone Mfg. Co. and the extensive protective business formerly conducted under the name of Frank B. Cook. The company will manufacture the equipment for the Corwin semi-automatic system in the Cook factory at Zion City, Ill. The general offices and sales room will be in the Hearst Building, Chicago. An early issue of TELEPHONY will contain an article giving a full description of the new equipment.

### Specialists in Telephone Office Forms.

The accompanying illustrations show views in the printing plant of the Phono-Print Company, of Defiance, Ohio. This company makes a specialty of supplying Independent telephone companies with printed and ruled office forms of a large variety, suited to exchanges of any size. From a very small and humble beginning a few years ago, the Phono-Print Co. has succeeded in building up a large and continually growing business extending over the entire United States, Cuba, Canada and Mexico. The Phono-Print Co. owns a complete printing plant, housed in its own buildings, and equipped with all the latest and most efficient labor-saving machinery, making it possible to produce the output under ideal conditions and at low shop cost.

The company carries in stock a complete line of exchange records and blanks, such as corporation records, rental and toll records, lease and rental records, cash books, toll journals, toll ledgers, rental receipts, toll bills, combined rental and toll bills, trouble tickets, toll tickets, stock certificates, corporation seals, voucher checks, two-color bank checks, monthly check report blanks, orders on treasurer, two-color stationery, rubber stamps and paper clips, and is equipped to provide for any special requirements.

Corner of Press Room, Showing Job Presses.

Special emphasis is laid on the fact that the Phono-Print Co. is in position to furnish two-color lithographed stationery and toll tickets for telephone companies at prices that ordinarily do not cover the cost of the paper used in printing similar goods in a printing office where but one order is handled at a time. Specialization and organization have been the features that have made possible the rapid development of this telephone printing plant, and the Independent telephone companies everywhere have availed themselves of the opportunity to encourage further effort of growth and expansion of this institution. The Phono-Print Co. stands well at home among bankers and good business men, is ably financed and has a good reputation for fair dealing with its customers.

View in Press Room, Showing Larger Presses.

**Important Changes of Standard Underground Cable Co.**

The Standard Underground Cable Co. announces the following important changes in its Chicago and St. Louis office territories, consequent upon the death last fall of J. R. Wiley, who, for nearly 20 years was the company's western manager, with headquarters at Chicago. E. J. Pietzcker, formerly southwestern sales manager, is made western and southwestern sales manager in charge of the Chicago and St. Louis offices of the company, the combined territory of which, broadly speaking, embraces the Mississippi river basin; he will divide his time between these two offices. Mr. Pietzcker has been connected with various branches of the wire and cable industry substantially throughout his entire business experience and is especially qualified to serve the customers of a company which devotes its entire energies to the field of electrical wires and cables and their accessories. He was born in Rochester, Ohio, on December 22, 1857, and at first was connected with Sanborn and Warner, who operated under territorial contracts with the Washburn & Moen Manufacturing Co. Upon their expiration in 1891, he was regularly connected with the latter company as southern sales agent, for the states of Texas, Louisiana and Mississippi and the Republic of Mexico. In 1897, he was transferred to Chicago in charge of city sales until the Washburn & Moen Co. was absorbed by the American Steel & Wire Co., for which company he attended the Paris Exposition as a representative, in 1900, and was subsequently connected with its Chicago office as salesman and expert in the rail bond department.

E. J. Pietzcker.

In 1902 Mr. Pietzcker joined the forces of the western sales department of the Standard Underground Cable Co. under J. R. Wiley, in Chicago, where he continued until January 1, 1905, when the St. Louis office was established under Mr. Pietzcker's charge. Mr. Pietzcker is a member of various organizations, including among others the Missouri Athletic Club, Midland Valley Country Club, St. Louis Amateur Athletic Club, Engineers Club, and League of Electrical Interests. He is also a Mason and a Shriner; member of the Knights of Pythias, Knights of Honor, an associate member of the American Society of Mechanical Engineers and the American Society of Electrical Engineers, and a member of the Jovian Order.

W. M. Rogers, formerly chief clerk and assistant to Mr. Wiley, is appointed assistant western sales manager, with headquarters at Chicago. Mr. Rogers has been connected with the Chicago office of the company since December, 1900, and is already well known personally to very many of the company's customers in that territory.

R. C. Houck, who has been appointed assistant southwestern sales manager, with headquarters at St. Louis, has been connected with that office of the company since its organization in 1905, during which time he has represented the company as a salesman in the southwest.

E. E. Woodbury is added to the selling force of the St. Louis office and is transferred for that purpose from the general sales department of the company, at Pittsburgh, with which he has been connected for the past six years.

**Profit Sharing Plan of Detroit Insulated Wire Co.**

The Detroit Insulated Wire Co., of Detroit, Mich., has issued a letter to its employes announcing a holiday distribution of a portion of its profits, under an employes' profit sharing plan. The letter, which is signed by C. A. Midworth, treasurer, is as follows:

To our Employes:—

The company is pleased to again announce, that as a result of our combined effort, it is able to make distribution of a portion of its profits to its employes, as in former years.

Salaried employes who have been in our employment continuously for 12 months or more, will receive a donation of one per cent of their entire salary for the period ending December 15th, 1913. Hourly rate employes who have been in our employment continuously for 12 months or more, will receive a donation of two per cent. of their entire wages for the period ending December 10th, 1913.

The company cannot guarantee similar donations from year to year, but it is hoped a distribution can be continued.

The reward is for faithful and continuous employment in order to emphasize the fact that continuity of service is mutually profitable.

As heretofore, we are depositing the amount of the donation to the credit of each employe in the Michigan Savings Bank, and each employe will be presented with a pass book or deposit slip with the donation entered therein or thereon. It is hoped that for your benefit you will permit the deposit to remain, adding to it from time to time out of your wages. An employe with a bank account is worth more to his employers than one without, for the reason that it encourages thrift and industry. Your pass book or deposit slip will be handed to you on Wednesday, December 24th, at quitting time.

The company wishes you a Merry Christmas, and a Prosperous New Year.

**John Bellamy Taylor, Consulting Engineer.**

John Bellamy Taylor, after 14 years' connection with the General Electric Co., has given up his most recent position as engineer of the foreign department in order to take up work independently as a consulting engineer. Mr. Taylor was graduated from the Massachusetts Institute of Technology in the electrical engineering course, class of 1897, following preparatory studies in the schools of Brookline, Mass., where he was born in 1875. Following graduation and before joining the forces of the General Electric Co., he was with the New England Telephone & Telegraph Co., on testing and locating troubles, as a "noisy line doctor," as manager of the Burlington, Vt., exchange, and as assistant to the division superintendent, at Lowell, Mass. Coming to the Boston office of the General Electric Co., in 1899, in the office of the district engineer, he remained there until 1902, when he was transferred to the railway engineering department, at Schenectady. In this department, and until appointed one of the company's consulting engineers, in 1910, Mr. Taylor's work was on the details and problems of power house and sub-station design, transformer and rotary converter operation, parallel operation of alternating current

John Bellamy Taylor.

machinery, systems of connections for transmission and distribution, etc.

At the time the single railways began to attract public attention, Mr. Taylor's previous telephone experience led him to foresee many of the serious difficulties to be encountered in the telegraph and telephone problems presented, and devoted himself actively to tests in the laboratory and in the field to points bearing on the signal and power relations. He presented a paper before the American Institute of Electrical Engineers, in 1909, on "Telephone and Telegraph Systems as Affected by Alternating Current Lines," and his services were sought by the Western Union Telegraph Co. as an expert adviser in connection with the electrification of the N. Y., N. H. & H. R. R.

Bearing on the above problem, and perhaps related more closely to physics than to electrical engineering, may be mentioned Mr. Taylor's long continued interest in acoustical matters. Before graduating, parts of his summer vacations were spent in church organ factories, and, incidental to his other work, he has advised on and supervised organ work. He was one of the first to demonstrate the possibilities of the oscillograph in studying telephone and telegraph problems and for sound analysis. With other engineers of the General Electric, he applied the oscillograph to a study of some of the electrical and acoustical problems of the "telharmonium."

Mr. Taylor has taken an active interest in the work of the American Institute of Electrical Engineers and other scientific and engineering societies. The past year he was chairman of the Schenectady section of the A. I. E. E. He is an honorary member of the Association of Railway Telegraph Superintendents.

Mr. Taylor is keeping his residence in Schenectady, where he has his laboratory, and expects to divide his time between there and New York City.

### "Automatic Telephone."

The first 1914 number of "Automatic Telephone," the monthly house organ published by the Automatic Electric Co., of Chicago, is just off the press and is as attractive and "newsy" as any of its predecessors. A summary of the progress made in the spread of the automatic telephone during the past year is one of the articles having a general interest for all telephone men. The technical papers begun some time ago are continued and as usual contain matter of real value for operating and traffic men.

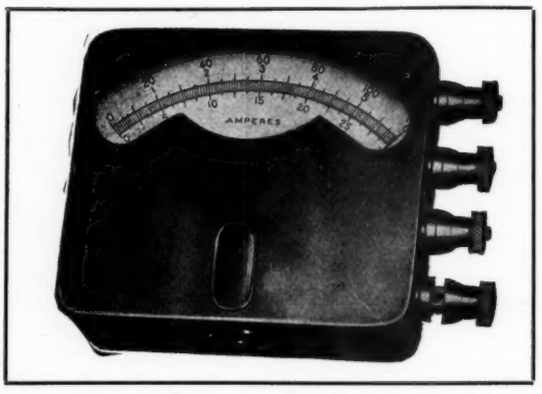
### New Pocket Voltmeters and Voltammeters.

A new model of pocket meter having improved movement and a scale 25 per cent. longer than any previous model of Pignolet pocket meters, has been brought out by Louis M. Pignolet, manufacturer of electrical instruments, 78 Cortlandt street, New York City. The instrument is a convenient pocket size, being 4½ inches long, 3½ inches wide and 1¼ inches deep. The new meter has 120 scale divisions, so that very close readings can be made with the instrument. The meter thus has as many scale divisions as a large meter of several times the cost.

The resistance of the special voltmeter and voltammeter for telephone testing, is about 80 ohms per volt, and each scale division equals one-tenth milli-ampere, which is probably considerably better than in the old model, and permits resistance to be measured with greater accuracy. In addition the extra long scale practically doubles the range of the meter for resistance measurements, and thus increases its serviceability in locating trouble.

The new instruments are constructed in a very thorough manner, it is claimed, with selected highly polished sapphire jewels, and pivots of special steel carefully ground and polished by hand, and hardened so as to stand hard use. As with the old model a zero adjuster is provided for correcting zero errors, the same as with the most expensive instruments. The binding posts are of improved type and make good connections, it is declared, with large or small wires without cutting or twisting them. Each meter is calibrated individually to insure accuracy, and is guaranteed.

Notwithstanding the improvements to these meters the

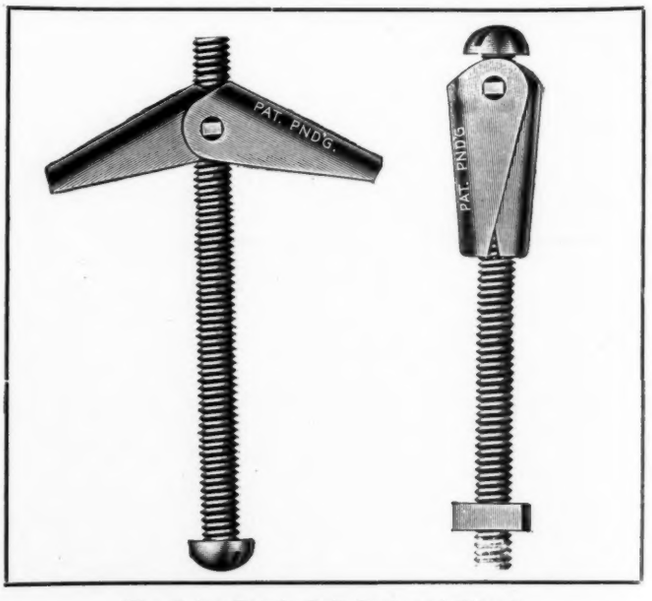



The New Pocket Meter with 120 Scale Divisions.

price remains low and within the reach of even the smallest exchange. They are also furnished in round cases for the wire chief's desk, etc.

### A New Type of Toggle Bolt.

A new type of toggle bolt which, it is claimed, differs fundamentally from the various types of toggle bolts at present known to the trade, has been brought out and is now being put on the market by The Paine Co., 1316 Corn Exchange Bank Building, Chicago, Ill. The construction of the Paine toggle bolt is such that it is adapted to go into the same size of hole as the ordinary type of toggle having the same screw diameter and it is stated that it will go into wall space where the hollow is too shallow for the gen-




The Paine Toggle Bolt Open and Closed.

eral type of toggle, the area required for its entrance being slightly more than one-half of that usually required.

The toggle bolt shown in the accompanying illustrations will pass through a 9-16-in. hole when closed, and in that condition it is only about 1 in. in length of head, and will work in hollow tile, having a hollow of only 1 1-8 ins.; while a hollow as great as the spread of head—

about 2 ins.—is usually required. This bolt folds in the manner shown, to insert in the hole; and when the head has passed the inside of the hole the spring instantly throws the two halves of the head out to a spread of about 2 ins. The two parts of the head swivel on the trunnions of the nut, and also engage the thread or head of the bolt, which gives additional holding power to the nut.

It is claimed that the action is absolutely positive in every case, and does not depend upon a tilting motion to go into place; and that its efficiency in ceiling or floors is just as great as in side walls, a superior advantage. This toggle is said to be of unusual strength. The moment it is opened a truss is formed whose base is the bolt itself, and the thread of the bolt becomes an ancilliary nut as well as a supporting resistance. An added advantage is that the same toggle can be instantly used with a finished screw-head outside, or reversed and used with a nut outside. The head is made on a true truss principal, deep in the center, tapering gracefully to the ends. The back of the truss rests solidly against the bolt, giving it all the advantages of a stiff, rigid head. Another advantage is that, to accomplish the same result, a shorter screw or bolt is used. The amount of screw which must be taken up in the ordinary use of the toggle, is reduced to nearly one half; thus saving, primarily, the cost of screws and bolts, and also saving in time and in the handling of the work.

It is asserted by the manufacturers that this toggle will hold as long as the wall will hold, or until the bolt breaks; and it is so constructed that it readily finds a seating in any kind of construction work. In telephone work it seems to be especially adapted for installing to any kind of wall having a hollow space.

### Selling Time Service to the Public.

The greatest lesson that "big business" has taught us is a proper realization of the value of by-products. That a "side line" can be made to play an important part in the successful conduct of almost any line of business is a fact that is being made evident in many striking instances, as in the pork packing and in the oil refining business.

Curiously enough, in the telephone field, we find little evidence of any attempt to secure returns from any other source than that for which the companies were originally organized. While the various telephone companies are essentially public service corporations, little attempt has been made to serve the public in other ways than by providing prompt and satisfactory telephonic communication.

One exception is the comparatively recent arrangement whereby Western Union messages are received and forwarded by the Bell system—a plan which has been a success from the start.

There are, however, other parallel sources of revenue open to all telephone companies and one of the most logical and important of all is the selling of time service to the public. This is a function for which the telephone company is admirably equipped, both by the nature of its services to the public and by possession of much of the physical equipment that the furnishing of dependable, economical time service demands.

The possibilities of return from this class of public service have, as yet, been merely touched upon—only the surface has been scratched. The one company (a telegraph company) that is attempting to sell time service to the public generally, at the present time, is not in a position to handle it as economically as any telephone company can. Its system demands the installation of an expensive clock mechanism at each subscriber's station, the first cost of which is a serious item, and the complicated construction of which involves heavy up-keep charges.

On the other hand the time system known as the "Monarch", made by Walker Brothers & Haviland, of Philadelphia, New York and Chicago, can be installed and maintained by a telephone company with comparatively small outlay and with up-keep costs for subscribers' stations that are so small as to be practically negligible, it is claimed. An electrical impulse from the master clock, located at the central station, is transmitted to each secondary clock, or time stamp, at intervals, providing a complete, synchronous system with every unit in unison. The subscriber's mechanism consists of but a clock face, or time stamp, with no key-wound or electrically wound mechanism—and with nothing but the necessary pawl and ratchet to transmit the electrical impulse to the clock hands or type wheels. There is nothing complicated to get out of order, nothing to be tampered with or readily susceptible to accidental injury. Upkeep cost is therefore reduced to almost nothing.

The "Monarch" line, made by Walker Brothers & Haviland, with offices in Philadelphia, New York and Chicago, also supplies a complete equipment of time recording devices. These additional units include various styles of in-and-out employes' time recorders, program bell ringers, cost recorders, etc., such as will serve every need for private residences, schools, hotels, public buildings and industrial and business establishments.

With the installation of a Monarch master clock the central station is therefore in a position to solicit time service business of any character from any subscriber within its zone. The ability to offer a contract that will provide a complete, synchronized time service for an industrial plant, or a hotel, is the entering wedge to the closing of large single contracts.

Another phase of the suitability of the equipment of telephone companies for economically and profitably handling time service business is found in the bookkeeping facilities. While another concern might experience considerable difficulty in satisfactorily handling and collecting a multitude of small accounts with concerns and individuals, the majority of which possess no commercial rating, the telephone company already can be presumed to have a highly efficient organization for controlling credits, making collections and promptly entering and billing items of such character. Since time service would rarely be rendered to other than present telephone subscribers, few new accounts would need to be opened. This eliminates the cost of investigating and establishing credits that is ordinarily a fixed charge in taking on new business. The same financial arrangements and restrictions that obtain with reference to telephone bills can very properly and satisfactorily be applied to the time service charges.

Much of the wiring that would otherwise be necessary is already available to the telephone company through idle wires, laid with a view to future expansion of the telephone business in a given direction, and through broken or split pairs that are to be found in nearly every cable In addition, the use of conduits, already laid, and of supports for aerial cables, as well as the additional utilization of valuable right of way privileges, permits the telephone company to bring its physical equipment up to a greater percentage of efficiency, expressed in terms of actual earning capacity.

Another valuable advantage gained by a Monarch installation has a definite bearing on increased efficiency in the operating end of the telephone business. This is found in the placing of a time stamp on the toll desk for the accurate recording of toll line messages.

Where the computation of charges is on a so-much per-minute basis, the advantages of this method over that of depending on the glance of a low-salaried operator at a dollar watch or a cheap alarm clock are obvious.

The advantages of a Monarch time stamp, in this con-

nection, over the use of key-wound time stamps, is said to lie in its dependable accuracy under hard use, since there is no complicated mechanism to get out of order from the constant hammering of hurried operators; also, the simpler mechanism makes a lower initial cost possible. These timing units are furnished to print the time in quarter or tenth minutes.

Figured on the basis of a charge of 75 cents per month for each subscriber's clock installation, and $2.50 per month for each time stamp installation, it is declared that returns from a time service business will show a profit from two to three times as great as that secured from the investment of the same sum in telephone equipment. This permits the telephone company to reduce the schedule of charges given above, in such cases as it may appear advisable to do so, and still show a good profit on the time business handled.

### The Rives Holdfast.

The Rives Holdfast, a little device recently described in these columns, convenient for assorting papers, bills, toll checks, etc., is meeting with good success in the telephone field. Many of the larger companies are using it and it seems to admirably answer all purposes. It permits of free circulation of blood in the finger, although when placed on the finger, remains rigid. It appears to be a happy solution of what has been wanted by telephone companies for the purpose described, for use in offices and operating rooms. The device is manufactured by The Rives Holdfast, 39-41 Walker street, New York City.

The Rives Holdfast.

### Stewart Test Set at the Conventions.

Stewart Bros., of Ottawa, Ill., will be in attendance at the convention of the Independent Telephone Association of America, at the LaSalle Hotel, Chicago, on January 6, 7 and 8, and at the convention of the National Independent Telephone Association, at the same place on January 13, 14 and 15, to demonstrate the well known Stewart test set. For the benefit of those not acquainted with this set a brief description is here given.

The Stewart test set is a device by which a lineman can tell approximately how far trouble is from the tester. It aiso tells, without opening a wire, which way the trouble is from the tester. It is a complete telephone, having transmitter, battery, induction coil, and powerful generator that will ring through on long heavily loaded lines.

In addition to this exhibit the company will also have on display a sample of its new mile-meter. This is an instrument for testing on telephone lines. Instead of its scale being marked off in volts, as in a voltmeter, it is marked in miles. It also has an ohm scale. A voltmeter, it is said, cannot be marked off in this way as it is impossible to keep a constant voltage, whereas the mile-meter is so constructed that it does not vary with the voltage, and therefore its scale can be marked in ohms or miles.

This instrument is constructed so that it can be operated with a generator in the case, or from an outside battery, as desired. It is claimed that a change of voltage will not affect the accuracy of its reading, and that 30 volts will give the same reading as 40 volts, on the same resistance.

The advantage of the instrument over a voltmeter is claimed to be as follows: A voltmeter reading on a case of trouble must first be changed to ohms by a mathematical process, and from ohms to miles by another mathematical process, thus it is necessary to take a reading and work out two problems, while with the mile-meter one can read the miles off the scale and no mathematical process is necessary.

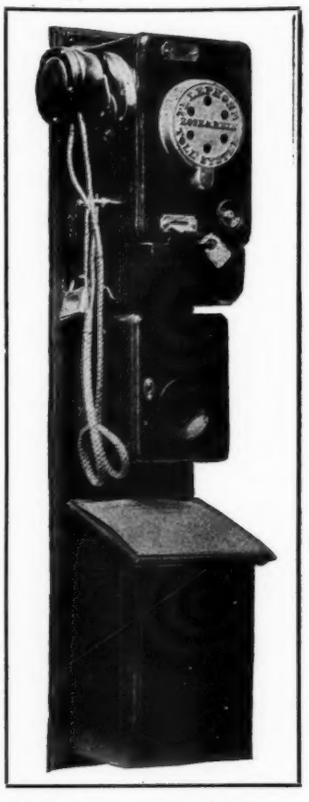
Both the Stewart test set and the mile-meter are sure to attract attention at the conventions and the opportunity will be a good one to investigate them.

### First Nickel in the Slot Telephones—1885.

Contrary to popular impression and even the impression of many who have been in the telephone business during recent years, progress along some lines in the telephone business has been remarkably slow and the adoption of improved apparatus has not followed rapidly after its first introduction.

This is indicated by the accompanying illustration of a telephone which was used in St. Louis in 1885, at which time there were some six or seven hundred of these telephones in operation, showing that even at that early date a prepayment nickel pay station with nickel return feature was in successful use.

That this present day accepted practice was fathered by Independent telephone development and that the Independents really set the pace is shown by the same illustration, for this telephone, now an interesting historical exhibit, was manufactured by the Franklin Electric Works. This business was later taken over by P. C. Burns, of the American Electric Co. The telephones were made for the use of the Pan Electric Telephone Co., which operated a successful Independent plant at St. Louis nearly 30 years ago.



Early Prepayment Telephone.

### Paragraphs.

The Brookfield Glass Co., 2 Rector St., New York, manufacturer of glass insulators, announces the opening of a Southern office in 415 Fourth National Bank Building, Atlanta, Ga. D. R. Peteet, formerly an official of the Southern Bell Telephone & Telegraph Co., will be in charge and have every facility for rendering quick service to patrons.

The Burnley Battery & Mfg. Co., North East, Pennsylvania, manufacturer of Burnley soldering paste, Burnley soldering salts, Burnley soldering stick and the Burnley dry battery, has issued a circular to the trade stating that it has brought suit for alleged infringement of the Burnley patent No. 608,973 for soldering paste, against dealers in the Allen soldering paste and the Nokorode soldering paste.

The Nungesser Carbon & Battery Co., 1170 East 38th street, Cleveland, Ohio, is sending out to patrons its 1914 "baby giant calendar," calling attention to the "1900" dry battery and Acme Rapid Fire battery. The company will be glad to send a calendar to any who have not received one.

COFFEY SYSTEM
on exhibit at BOTH CONVENTIONS, Room 1750
Coffey System & Audit Co. -:- Indianapolis

BOLTS LAG SCREWS, WASHERS BRACES, ETC.
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